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BACKGROUND: The Defense Threat Reduction Agency (DTRA) was founded in 1998 to integrate and focus the capabilities of the Department of Defense (DoD) that address the weapons of mass destruction threat. To assist the Agency in its primary mission, the Advanced Systems and Concepts Office (ASCO) develops and maintains an evolving analytical vision of necessary and sufficient capabilities to protect United States and Allied forces and citizens from WMD attack. ASCO is also charged by DoD and by the U.S. Government generally to identify gaps in these capabilities and initiate programs to fill them. It also provides support to the Threat Reduction Advisory Committee (TRAC), and its Panels, with timely, high quality research.

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KEY FINDINGS

Throughout the Cold War, Britain, France, and China settled upon deterrence at much lower levels of nuclear weapons than the United States and the Soviet Union did largely due to the interplay of economic, technical, political, and strategic factors. The three countries could not invest more resources into nuclear weapons without sharply impairing their conventional force postures or national economies. In technical terms, the enormous destructive power of thermonuclear weapons enabled each country to hold at risk very sizeable percentages of their larger adversaries' population and industry, with relatively few weapons. Strategically, each concluded that beyond a sufficient level of such assured destruction, fuzzy as those calculations were, more nuclear weapons were superfluous or, in the case of France, destabilizing. In short, each country made a virtue of its limitations.

Rogue states, such as North Korea, can be expected to emulate at least some aspects of the British, French, and Chinese approach to deterrence at low levels of nuclear weapons. Particularly after the results of Operation Iraqi Freedom, rogues are likely to be drawn to nuclear weapons as perhaps the only viable means of deterring a larger power, specifically the United States. As in the case of Britain, France, and China, rogues can be expected to pursue and utilize nuclear weapons for broader political purposes beyond deterrence. For example, central to the debate over Pyongyang's intentions is the extent to which its nuclear weapons program is really designed to extract political and economic concessions from the United States. Rogue states can also be expected to emulate and even amplify China's approach to concealing the size, scope and reach of its nuclear forces, the better to maximize an adversary's uncertainty and induce caution. Whether rogue states would differ from their predecessors and come to view nuclear weapons as warfighting tools is an open question.

Rogue states may strive for and succeed in achieving nuclear deterrence at significantly lower levels than even Britain, France, and China. The perception is growing, for example among Chinese military planners, that the United States would not hazard the loss of even a single U.S. city to nuclear attack. This greatly lowers the scale of nuclear force building required of rogue states, not least because the design parameters of a nuclear "device" delivered by covert insertion are quite low and relatively affordable. In contrast to most of their predecessors, there appears to be no compelling rationale for rogue states to pursue thermonuclear weapons when in today's environment, a handful of fission seems adequate for deterrence purposes. This makes the costs of playing the nuclear game more manageable for the rogue states.

Given lingering security concerns about Russia and China, as well as emerging threats and future uncertainties, low level nuclear deterrence appears to have very limited applicability to the United States in the near- to mid-term, with three possible exceptions:

1. For varying yet significant periods throughout the Cold War, Britain, France, and China were able to conduct nuclear planning without publicly specifying an enemy. Their experience may prove useful in an era of capabilities-based planning and provide a model of future U.S. declaratory nuclear policy.
2. The British and Chinese examples challenge the notion that deterrence at low-levels of nuclear weapons must always be tied to targeting cities, a notion that inhibits consideration of "minimum deterrence" in some U.S. circles. Rigorous modeling and Team B exercises involving knowledgeable outsiders should test this proposition within the context of future U.S. and Russian nuclear force levels.
3. In 1998, Britain decided not to discontinue its uninterrupted practice of having at least one ballistic missile submarine at sea at all times on the grounds that to re-introduce such patrols during a crisis might be perceived as highly provocative. The same reasoning would seem to apply not only to U.S. operational nuclear forces but also the "responsive force" of reserve warheads. Unless some portion of this reserve is routinely activated for peacetime training purposes, U.S. military planners cannot take for granted the decision of the political leadership to activate it in time of crisis.

INTRODUCTION

On behalf of the Advanced Systems and Concepts Office (ASCO) of the U.S. Defense Threat Reduction Agency, Science Applications International Corporation (SAIC) has completed this assessment of deterrence at low levels of nuclear weapons. Consistent with its charter to be a forward-looking source of ideas to help inform current and future U.S. defense policy, ASCO commissioned a review of how certain nations have conducted nuclear deterrence with only a few hundred nuclear weapons at their disposal. The ultimate goals of this study are twofold: to begin to assess the strategic implications of significantly lower levels of U.S. nuclear weapons that might be attained in the decades ahead and more immediately to identify how rogue states with new or emerging nuclear weapons capabilities might seek to deter the United States.

Building upon a predecessor study completed by SAIC in mid-2001, this study takes a closer look at the origins and evolutions of nuclear strategy, doctrine, and force posture in the United Kingdom, France, and China, each of which have for decades maintained no more than a few hundred operational nuclear weapons. Arguably, these countries are said to ascribe to “minimum deterrence.” That phrase lacks precision, however. It is generally interpreted as being able to inflict, in a second-strike, a level of damage that while sufficient to deter a would-be aggressor, falls well short of societal or global annihilation normally associated with the “maximum deterrence” postures of the United States and the Soviet Union during the Cold War. In some circles, minimum deterrence is automatically equated with indiscriminate nuclear strikes on cities. Yet, as the case studies in this report make clear, the actual and perceived targeting strategies adopted by the United Kingdom, France, and China are generally more nuanced in this regard. Accordingly, this study adopts the less elegant but perhaps more accurate expression of “deterrence at low levels of nuclear weapons” as its primary term of reference.

Our research and analysis was designed to address to the extent possible in the open sources the following key questions:

1. What specific behaviors on the part of its perceived actual or potential enemies did the United Kingdom, France, and China seek to deter with nuclear weapons? How did these behaviors change over time?
2. What assumptions, threat perceptions, political, and technical considerations initially shaped nuclear strategy, doctrine, and force posture in the United Kingdom, France, and China? How did these change over time?
 - a. What considerations for the European Union were made by France and the United Kingdom in their nuclear strategy, doctrine, and force posture? How did these change over time?
3. For each country, are these assumptions, threat perceptions, and technical considerations still valid today? What has changed?

4. How have the three countries evaluated the crisis stability of deterrence at low levels of nuclear weapons? How has this changed over time?
5. What makes different targets attractive for deterrent purposes? What are the psychological and cultural factors on the part of both sides to a potential nuclear conflict that influence nuclear target selection? What determines the “value,” meaning, significance, importance, and consequence of targets to both sides of a potential nuclear conflict? What are the criteria used to select nuclear targets? How have these changed over time? How have they differed by nuclear-armed country?
6. More generally, what are the political, military, economic, and moral trade-offs between small numbers of nuclear weapons and target selection that each nuclear-armed country has made? How have these trade-offs changed over time?
7. To what degree of detail do nuclear threats need to be communicated to effectively deter the specific behaviors that nuclear-armed countries seek to deter?
8. How might the approaches of the United Kingdom, France and China guide thinking in emerging nuclear states? To what ends?
9. What generic novel approaches in strategy, doctrine, and force posture might rogue regimes with a small number of nuclear devices develop to deter or coerce larger powers?

Our approach to the project entailed an extensive, but by no means comprehensive, review of the unclassified literature on each country’s nuclear strategy. This research was conducted in Washington, D.C., London, and Paris. The SAIC team included analysts fluent in Chinese and French. A significant amount of French language materials in particular was reviewed, translated, and incorporated into this study.

At ASCO’s direction, our research for this study focused on the early formative period of nuclear strategy development in each country. SAIC supplemented this research with two experts meetings. The first of these was held jointly with the International Institute of Strategic Studies in London on November 20, 2002. The participants in this meeting were current and former officials from the British and French ministries of defense and nuclear weapons establishments, as well as prominent scholars. Coinciding with this meeting, the SAIC project team also conducted one-on-one interviews in London and Paris with current and former defense officials and scholars. The Paris interviews were conducted in French.

A second experts meeting was held on China on March 4, 2003 at SAIC’s McLean, Virginia campus. This session featured the participation of leading American experts on China, both in and out of government. A prominent Chinese scholar came from China to participate in the meeting, as well.

The report is organized into three main sections. Section one draws upon the main lessons of nuclear deterrence as practiced by the United Kingdom, France, and China to assess the applicability of deterrence at low levels of nuclear weapons to the United States. The same

approach is used to assess what lessons rogue states might derive and then use to try to deter the United States.

Section two includes the individual studies of nuclear strategy, doctrine, and force posture in the United Kingdom, France, and China. Each country study has its own appendix which deals in more detail with nuclear force structure.

Section three comprises the summary reports from the experts meetings.

The SAIC project team would like to acknowledge the following individuals for their special contributions to this project: Gary Samore, Malcolm Chalmers, Bruno Tertrais, Beatrice Heuser, and Kristina Zetterlund for their assistance in organizing the London experts meeting and helping to arrange the one-on-one interviews in London and Paris; Sir Michael Quinlan and John Simpson for sharing their views and writings; Ambassador Robert Oakley and Elaine Bunn for their advice on structuring our project and facilitating our access to the library of National Defense University; Brad Roberts and Avery Goldstein for their advice and insights on China; and Prof. Shen Dingli for providing a thoughtful Chinese perspective on nuclear strategy. The SAIC team bears sole responsibility for the contents of this report. This report does not necessarily represent the views of SAIC, its sponsor, or the US Government.

SIMILARITIES, DISSIMILARITIES, AND IMPLICATIONS

This section identifies important similarities and dissimilarities found in the nuclear strategy of the United Kingdom, France, and China, as detailed in the chapters that follow. These comparisons are grouped by theme, consistent with the structure of the individual case studies. This section also considers the implications of the examples set by these three countries for emerging nuclear rogue states, such as North Korea. Finally, this section considers the various implications of deterrence at low levels of nuclear weapons for the United States.

Overall, the experience of Britain, France, and China demonstrates that nuclear strategy is shaped by a combination of political, technical, economic, and cultural factors. Assigning a relative weight to these factors is, at best, a difficult task, however. Still, for all of their differences, the United Kingdom, France, and China demonstrate certain commonalities in their acceptance of nuclear deterrence at low levels of weapons.

I. The United Kingdom, France, and China: Nuclear Similarities and Dissimilarities

A. Threat Perceptions

Threat perception is a strong motivating factor in the decision to seek nuclear weapons. In each of the three cases, at least one larger power was perceived as posing a range of security threats, from the potential of nuclear blackmail, to physical invasion using conventional forces, to nuclear strikes against one's cities. Such threat perceptions can evolve over time in reaction to shifts in overall political relations, as well as changes in an adversary's force structure. Thus, for example, after the Sino-Soviet split in the 1960s, the Soviet Union figured more prominently in China's threat perception than did the United States. More recently, however, US determination to proceed with national missile defense has Chinese military planners concerned about the continuing viability of their limited strategic nuclear force. Both Britain and France have acknowledged the fundamental change in relations with post-Soviet Russia and have officially stopped targeting their respective nuclear weapons at it.

B. Political Factors

All three countries perceived that they needed to possess nuclear weapons to ensure that they could conduct an independent foreign policy. Sovereignty and independence were and continue to be the touchstones of French nuclear strategy. In essence, the *force de frappe* enables France to distance itself from U.S. policies deemed contrary to French interests. Britain, for its part, exploited nuclear weapons as a privileged mechanism for ensuring close consultation with the United States, the better to moderate U.S. behavior in accordance with British interests. At the same time, Britain promoted its nuclear capability as an independent "insurance policy" in the event, however unlikely, that it had to face the Soviet Union on its own. These two rationales were not easily reconciled within British nuclear planning or Anglo-American relations, however. China similarly saw nuclear weapons as a means of enhancing its diplomatic maneuverability, especially in terms of asserting a leadership role amongst communist and non-

aligned countries. Certainly within leadership circles, each country believed that great prestige and status was conveyed by the possession of nuclear weapons.

C. Economic Factors

Economic constraints were an important prerequisite to acceptance of deterrence at low levels of nuclear weapons. Each of the three countries suffered from severe economic constraints as they embarked upon their nuclear weapons programs. Britain and France were recovering from the Second World War, as was China, which had the additional handicap of being a developing nation. Despite these constraints, each country made substantial sacrifices in their conventional forces and civilian infrastructure to develop and maintain nuclear forces, a testament to the importance attached to them. Yet, the costs associated with maintaining these forces, particularly in the face of rapidly advancing technologies, encouraged decision makers in each country to find ways to cap or even reduce the nuclear burden. This effort was perhaps most pronounced in Britain, where the cost-cutting imperative at times superceded the strategic rationale for sizing its nuclear forces. Accordingly, the notion that a smaller power could deter a much larger power with only a modest nuclear force was very attractive, indeed. In short, each of the countries effectively made a virtue of the low levels of nuclear weapons it was able to afford.

D. Deterrence Theory

If the advent of atomic weapons made it conceivable for these smaller powers to deter larger powers, that effect was greatly magnified with the onset of thermonuclear weapons. None of the countries was content to remain at the level of fission weapons. Indeed, Britain made a major public statement in this regard, asserting that thermonuclear weapons were the “great leveler,” an indispensable tool of deterrence and vis-à-vis the Soviet Union and influence vis-à-vis the United States.

Each of the countries also recognized early on that for deterrence to be effective, one’s nuclear forces had to be able to survive a surprise attack and then penetrate to their intended targets. All three countries developed varying degrees of survivability for their nuclear forces as a result.

The concept of “sanctuary” is clearly important to French and British nuclear theory and is presumably so for China. That is, nuclear weapons are seen as a means of warding off major aggression against one’s homeland, be it in the form of nuclear attack or invasion.

All three countries acknowledged the unreliability of extended deterrence in era of mutual vulnerability. Britain was perhaps the first of the three to come to this conclusion, recognizing that once Soviet nuclear weapons could be delivered against the U.S. homeland, Washington would be much more reluctant to come to Europe’s defense. In the parlance of deterrence, the United States “would not risk New York to save London.” The realization by France that the U.S. nuclear guarantee was unreliable was an important motivation to seek nuclear weapons in the first place. China similarly concluded that once the United States was vulnerable to nuclear attack, it would not risk “Los Angeles for Taipei.”

Nuclear Weapons generally were not seen as warfighting instruments but rather tools of political persuasion. Numerous declassified British government documents from the 1950s emphasize this point, as do public pronouncements of the French going back decades. China has made similar public statements, although many U.S. analysts wonder if this attitude will endure as Chinese nuclear and conventional forces continue to modernize. Regardless, professional military imperatives seem to dictate the need to plan for the use of nuclear weapons, both to enhance the credibility of deterrence threats and to hedge against their possible failure to keep the peace.

Given the enormous stakes involved, each country apparently allowed for a lower-level nuclear “warning shot” in its doctrine; in essence, a final admonition that an aggressor must immediately cease its attack or face strategic nuclear use. In France this is known as the “pre-strategic” option. The United Kingdom calls it “sub-strategic” nuclear use. Publicly, China does not entertain such an option, clinging instead to its official pledge of no-first use of nuclear weapons. Privately amongst themselves, however, Chinese strategists seem to countenance situations in which China might use nuclear weapons first.

E. Force Levels

All three countries reached the conclusion that beyond a certain level of assured damage that it was able to inflict on an aggressor in a second-strike, additional nuclear weapons were unnecessary. What that level of assured damage was and how many weapons were needed to achieve it varied among the three, however, due to distinctive national approaches to nuclear planning. One area of common concern has been the potential negating effect of missile defenses on small nuclear arsenals.

From the late-1950s onward, Britain had the advantage of joint nuclear planning with the United States. With this came the confidence of knowing how many U.S. nuclear weapons would be used against the Soviet Union and in what manner. This “deterrence in concert” enabled Britain to limit its strategic nuclear forces at or below 200 operationally deployed weapons. This number seemed to be a compromise between often conflicting desires to make a “politically significant” contribution to the Western deterrent and to pose a sufficient threat to the Soviet Union, independently of the United States and NATO.

France seems to have adopted a simple but compelling 1:1 ratio. That is, French military planners concluded that they had to be able to inflict as much damage on the Soviets as France was “worth” to them, in terms of population and industry. So whereas France’s population numbered 45 million in the 1960s, its nuclear forces had to then be capable of killing an equivalent number of Soviet civilians.

For China, the number of nuclear weapons deemed necessary has been much lower. With at most 24 ICBMs currently, China evidently believes it can deter the United States by holding relatively few cities at risk. Indeed, Chinese strategists speculate that the United States would be unwilling to risk even a single city in a conflict with China. Because its level of nuclear sufficiency is so low, however, China is particularly sensitive to the impending

deployment of US national missile defenses. China makes no secret of its intent to counter such defenses to ensure the continuing viability of its deterrent.

Missile defenses have been a major concern for the United Kingdom, as well. In the 1970s, it undertook a very costly program to improve its Polaris SLBM reentry vehicles in order to ensure their penetration of the Moscow ABM system. Even then, the offense-defense exchange ratios were such that an entire submarine load of Polaris missiles would likely have been needed to ensure the destruction of Moscow. Throughout the 1970s and 1980s, for as much as half of each year, the Royal Navy only had one such submarine on routine patrol. France overcame its concerns about the Moscow ABM system by MIRVing its SLBMs.

F. Targeting

Cities were a common but by no means exclusive target set for each country's small nuclear forces. In part, because nuclear weapons become available only slowly and in limited numbers at first, there typically was a desire to only apply them for the "biggest effect." This made cities a natural target for nuclear weapons. The conventional bombing campaigns against urban and industrial centers in the Second World War and the atomic bombings of Hiroshima and Nagasaki represented strategic continuity in that sense. However, the case of Britain is instructive in that its targeting policies went beyond simplistic notions of "city busting."

In the late-1940s, the British emphasis was on counter-city bombing but also included serious consideration of attacking the USSR's oil resources in the Caucasus, as a means of retarding the Soviet war machine. From roughly 1950 to 1955, Britain's targeting emphasis shifted to Soviet theater nuclear-forces, in perhaps one of the earliest considerations of "counter-force." As those Soviet forces grew, the prospects for a meaningful British counter-force attack diminished greatly and British nuclear strategy shifted back to counter-city. There were important refinements, however, in order to make such targeting more discriminate within the constraints of delivery system accuracy and weapons yields.

For the duration of the Cold-War, French nuclear targeting was unequivocally counter-city. To the extent the French had any moral reservations about such a posture, a distinction was drawn between the "mere" targeting of civilians and actual nuclear use against them. More pointedly, for French planners and strategists, there were no practical alternatives to urban targeting that could deliver the same levels of unacceptable damage deemed so essential to deterrence.

China's nuclear targeting policy appears to have been a mix of counter-value and counter-force and may remain so today. As inferred from the range and accuracy of its ballistic missiles, China appears to have aimed at key targets within reach, adding additional targets when capabilities, especially range, increased. Thus, in a building block approach, the DF-2 missiles were capable of reaching Japan, while U.S. military installations in the Philippines and Guam could be reached by the DF-3 and DF-4, respectively. In time, China deployed the DF-5 which put U.S cities at risk.

Regardless of other targeting preferences and actual timelines for achievement, each of the three exhibited a policy of holding the adversary’s national capital at risk. For the United Kingdom, this was the well-known “Moscow criterion.” France similarly made the targeting of Moscow a high priority, as did China following the Sino-Soviet split. With respect to the United States, China concluded that it needed to hold Washington, DC, and New York at risk.

G. Communication

The need to communicate one’s nuclear capability and the will to use it is widely understood by the three countries. Numerous ways exist to communicate capability, from conducting nuclear tests to deploying and maintaining operational nuclear forces. Intent is most typically conveyed in public statements by the government, in the form of annual defense reports, legislative debate, or other pronouncements by key leaders. Britain has a large body of documentation in this regard, as does France. The degree of specificity has varied over time, however. Up until 1948, for example, the British military was prohibited from naming the Soviet Union as the principal enemy. France did not openly identify the USSR as a target of the *force de frappe* until the 1970s.

During the period when Britain was wed to the doctrine of massive retaliation, London understood the importance of conveying to the Soviets in advance that any major aggression on their part would trigger a devastating blow against their heartland. French presidents publicly emphasized their unflinching determination to “push the button.” These efforts at public communication, regardless of degree of specificity, seem to have been regarded as highly effective. An informal poll of selected British and French officials and scholars who participated in this project, as well as the research for the country case studies, turned up precious little in the way of private threats that were deemed necessary by London or Paris to bolster deterrence during the Cold War.

Nuclear signaling by China poses complexities of its own. Consistent with ancient Chinese military tradition, deliberate ambiguity is at the heart of China’s nuclear strategy. Arguably, concealment and deception have until recently enabled China to get by with a very limited strategic nuclear force. Language has been another impediment to developing a better understanding of Chinese nuclear thinking. Indeed, the term “deterrence” in Chinese has the connotation of offensive action, contrary to Beijing’s no-first use pledge, and thus the term has not been adopted by China’s leadership. China has not adopted the Western jargon of deterrence, nor does it appear to have absorbed the Soviet model of using nuclear force alerts and deployments as a way of signaling intent, perhaps contrary to U.S. expectations.

Deliberate ambiguity is not an exclusively Chinese trait, however. Both Britain and France were extremely reticent to specify the conditions under which they would resort to using nuclear weapons. As smaller powers, they did not wish to inadvertently signal what types of attacks could be safely initiated by the Soviet Union underneath the nuclear use threshold.

H. Stability

Each of the three countries has looked upon its modest nuclear arsenal as a stabilizing influence internationally, with important provisos. In terms of arms race stability, the United Kingdom, France, and China have fully embraced the notion that beyond a certain level of assured destruction, additional numbers of nuclear weapons have no utility. Hence, each country saw no need to compete quantitatively with the nuclear force levels of the United States and the Soviet Union. Indeed, between 1962 and 1970, British strategic nuclear forces declined significantly in the number of operational warheads. China, for its part, has concluded that the Soviet Union collapsed under the weight of an unnecessary arms race with the United States and is determined to avoid a similar fate.

In contrast, each country's nuclear warhead requirements have been sensitive to perceived offense-defense instability. There is a direct correlation, for example, between the number of ABMs protecting Moscow and the number of and type of reentry vehicles deployed by Britain and France. Within the Cold War context, the 1972 ABM Treaty was considered essential to the continuing viability of the British and French nuclear deterrents. As noted above, China is currently confronting the prospect that unless it undertakes suitable countermeasures, U.S. national missile defenses eventually could render its currently small ICBM force impotent. This is clearly a destabilizing development in China's eyes, as it would lay the country bare to U.S. coercion, particularly over the future of Taiwan.

The United Kingdom probably was the first of the three to be sensitized to the crisis stability aspects of low-level nuclear weapons possession. British military planners quickly recognized that the sooner they attacked Soviet theater nuclear forces, the lower the amount of damage Britain would likely receive. The piecemeal evidence that can be gleaned from available declassified documents suggests that in the mid-1950s British military planners were approaching a doctrine of nuclear preemption at the very outset of conventional hostilities with the Soviet Union. Strategists within and outside the British defense establishment were quick to point out the enormous risks of such a posture, which was soon revised in light of the rapid growth of Soviet theater nuclear forces.

Ironically, during the early- to mid-1950s, British strategists were more concerned about American initiation of nuclear war than they were about Soviet instigation. In essence, since the USSR could not yet deliver nuclear weapons against the U.S. heartland, Washington was perceived as having a greater propensity for risk taking. This concern lessened as mutual vulnerability was achieved, but it gave rise to a new stability concern, the aforementioned doubts about the credibility of extended deterrence.

Today, stability with respect to a future U.S.-China-Taiwan crisis is of high concern to strategists on both sides of the Pacific. In particular, Chinese military planners seem to be developing an integrated plan using conventionally-armed missiles, theater nuclear forces, and enhanced strategic nuclear forces to exercise escalation control over the United States in the event of such a confrontation.

II. Implications for Nuclear-Armed Rogue States

Caution is in order in attempting to extrapolate the experiences of the United Kingdom, France, and China to newly emerging nuclear-armed rogue states such as North Korea. While all three states demonstrate some basic commonalities in their approach to deterrence at low levels of nuclear weapons, context and culture have produced some important distinctions and would be likely to produce still other permutations amongst the rogue states.

Nonetheless, there are broad lessons that rogue states may well deduce from observing British, French, and Chinese behavior. In this regard, the importance of threat perception is worth highlighting. Perceived security threats played an important role in the decision to go nuclear. If there were any doubts in the minds of North Korea, Iran, or more recently Syria, that they were under direct threat from the United States, President Bush's "axis of evil" speech and other Bush Administration statements have laid them to rest. In reality, these countries perceived a U.S. threat long beforehand. Moreover, their threat perceptions are not focused exclusively on the United States, as in the case of Iran vis-à-vis Iraq and Israel. All of this is to suggest that the threat-driven, demand side of nuclear weapons acquisition was important earlier and is only getting stronger.

Rogue states would not necessarily view nuclear weapons exclusively as a means to deter aggression, on the part of the United States or others. As in the cases of Britain, France, and China, the weapons may also be pursued and utilized for broader political purposes, such as staking out a global, regional, or religious leadership role, as well as resisting U.S. coercive diplomacy. The case of Iraq indicates that Baghdad was attracted to nuclear weapons as a means of asserting its leadership over the Arab states and achieving greater political and military maneuverability vis-à-vis Israel. For this reason, the French concept of using nuclear weapons to establish a national sanctuary free from attack had tremendous appeal in Baghdad. Not surprisingly, key French writings on nuclear strategy could be found in Iraq and were widely quoted by Iraqi strategists. Central to the debate over Pyongyang's nuclear intentions is the extent to which the North Korean nuclear program is really intended to extract political and economic concessions from the United States.

The "buy-in" for a low-level nuclear deterrent capability is not prohibitive for many aspirants. In this case, China might provide the closest model, deploying no more than two-dozen single warhead ICBMs. Indeed, North Korea seemingly carries this model to its logical extreme, attempting to compel changes in U.S. policy by possession of perhaps only two nuclear devices and no demonstrable ICBM to date. Like Britain, France, and China, determined rogues can be expected to make substantial sacrifices in conventional forces and the civilian sector to achieve a nuclear weapons capability. The authoritarian nature of such regimes may confer certain resource allocation advantages in this regard but is by no means a prerequisite, as evidenced by India.

Where the rogues find other inspiration from the United Kingdom, France, and China is their belief that a small power can deter a much larger power, in this case, the United States. Indeed, Gulf Wars I and II will only reinforce the notion that possession of chemical and biological weapons is inadequate to deter the United States from intervening when it claims vital

interests are at stake. Washington has yet to undertake military operations, however, against a country that possessed operational nuclear weapons.

Sensitive to their relative military inferiority and vulnerability to precision strikes by U.S. conventional forces, not to mention any applicable non-proliferation treaty commitments, rogue states can be expected to emulate and even amplify China's approach of nuclear opacity. Such states are likely to reveal little if anything about the size, scope, and reach of their nuclear weapons, at least until such time as the weapons were possessed in quantity. Even then, rogues can be expected to cultivate ambiguity as to when they would resort to nuclear weapons and against what targets. As the relatively weaker powers vis-à-vis their main adversaries, Britain, France, and China each was extremely reluctant to reveal its respective nuclear use thresholds. Pakistan's emulation of this practice strongly suggests that the practice may become standard among emerging nuclear powers. As far as communicating one's nuclear capability, public assessments by the U.S. intelligence community and various non-governmental organizations have sufficed to validate that North Korea has nuclear weapons and presumably this phenomena would apply to other rogue states that follow.

Rogue states are likely to absorb and may believe they can benefit from other important trends previously identified in the British, French, and Chinese approach to low-level nuclear deterrence. Foremost of these is the steadily decreasing level of homeland damage that a major power is willing to tolerate which, in turn, increases the effectiveness of deterrence by small nuclear powers. As noted, Chinese strategists have already begun to conclude that the United States would be unlikely to risk the loss of a single U.S. city.

Events since September 11th may help to reinforce the perception that the United States has a very low tolerance for pain inflicted on the home front. Rather than focus on the ensuing war that the United States unleashed upon the Taliban, what a rogue may well see is that the "mere" loss of 3,000 civilians, principally in the destruction of two skyscrapers, exposed the "soft underbelly" of the United States. Similarly, just the possibility that Iraq might somehow facilitate a WMD attack against an American city was sufficient cause for the United States to go to war against that (non-nuclear) regime. In short, contrary to what policymakers in Washington might hope for as a result of its decisive action against Afghanistan, al Qaeda, and Iraq, other rogues may well conclude that the United States is brittle and can be successfully deterred by the threat of a single nuclear explosion in one of its major cities. That greatly lowers the scale of nuclear force building required by the rogue state, not least because the design parameters of a nuclear "device" delivered by covert insertion are quite low and relatively affordable. It bears recalling that the British were so concerned about the potential smuggling of Soviet nuclear weapons into their ports that their first nuclear device was tested in the hull of a ship to measure likely port damage.

Another way rogue nuclear states might benefit in terms of reduced technical and economic requirements would be to forego the progression from fission to thermonuclear weapons. Britain, France, China, and India for that matter, have not been content to remain at the level of fission designs. Yet, Pakistan for the time being has not crossed the thermonuclear test threshold, South Africa went out of the nuclear weapons business apparently without first achieving a thermonuclear weapons capability, and there are no public indications that North

Korea seeks or is poised to cross the thermonuclear threshold at this time. In short, today's rogue nuclear states and those that may follow could opt for truly minimal deterrents with much lower numbers and more rudimentary types of nuclear weapons than those of even the main traditional practitioners of low level nuclear deterrence.

The examples set by Britain, France, and China, as well as the events of September 11th, may lead a rogue state to place counter-city targeting against its regional adversaries and the U.S. homeland, assuming it had some method of long-range delivery (e.g., covert insertion, rudimentary ICBM), at the heart of its targeting policy. Other targeting options such as airbases, troop concentrations, or oil fields would presumably exist, as they did for the three countries, but the greatest psychological, political, and economic impact may come from nuclear use against urban areas, particularly if the rogue state has only a few weapons at its disposal. This assumes, of course, that the rogue will give some forethought to targeting. In reality, such a policy, much less a targeting plan, may not be developed for some time, particularly if the rogue hovers in an existential or non-weaponized deterrent phase for a prolonged period. Even then, distinctive cultures and diplomatic strategies could produce some surprising targeting choices. Witness, for example, South Africa's approach to "nuclear targeting." In essence, if South Africa was on the verge of being overrun by her neighbors, it would have conducted one or more nuclear tests and then hoped that the superpowers would intercede and impose a cease-fire. Because it is difficult to anticipate precisely how a rogue nuclear state might employ nuclear weapons, at a minimum we must plan for uncertainty in this regard.

As for stability concerns, fears of U.S. preemptive attacks are henceforth likely to be paramount amongst rogue nuclear states. This suggests an even greater investment by the rogues in concealment, camouflage, and deception measures. No doubt, rogue states with nuclear aspirations will be watching very closely as the United States reveals where and how Iraq hid its WMD assets. In the event of an eventual show-down with the United States, a nuclear-armed rogue state may well find itself confronted with a nuclear use-or-lose dilemma, again based on the likelihood of high-precision U.S. preemptive attacks, as well as the negative example of Iraq.

III. Implications for the United States

The implications for the United States of deterrence at low levels of nuclear weapons fall into two main categories. The first is to what extent the current and any future draw-down of U.S. strategic nuclear forces can benefit from understanding the lessons experienced by Britain, France, and China. The second deals with what steps the United States needs to take today and in the years ahead to counter the nuclear threats posed by rogue states. These aspects are considered sequentially below.

The question begged by the case studies is whether and to what extent the current U.S. strategic nuclear force posture can transition to comparably low levels of deterrence. This is a complex question involving the perceived utility of nuclear weapons; force planning calculations; threat perceptions; arms control trends and possibilities; the availability of non-nuclear alternatives, including missile defenses; and targeting policies. Even a cursory examination of these factors strongly suggests that the U.S. will be inclined to maintain a four-figure nuclear force well into the middle of the century.

Ostensibly, recent events tend to de-emphasize the importance of nuclear weapons to U.S. military strategy. As made painfully clear on September 11, 2001, al Qaeda was not the least bit deterred by U.S. nuclear forces. In short, there is little to suggest that nuclear deterrence has a role to play in what is perceived as one of the gravest threats to U.S. national security, terrorism against the homeland. The quick, non-nuclear means by which the United States dispatched the regime of Saddam Hussein similarly reinforces the notion that nuclear weapons do not have direct utility in countering today's most urgent security threats.

Yet, we must recall that Russia still maintains a large strategic nuclear force. In spite of severe economic constraints, Russia continues to modernize that force and is expected to try and preserve as much of it as possible for as long as possible. This stems from the much needed international prestige associated with nuclear weapons in Russian thinking, as well as the greater reliance on nuclear weapons to offset Russia's conventional force weakness and lack of high-precision conventional weapons. While the political relationship between Russia and the United States has fundamentally changed since the end of the Cold War, it will take a gradual and sustained process to reach the point where America is no more concerned about Russia's nuclear capabilities than it is about Britain or France's. In short, although the United States claims that its nuclear force levels are no longer specifically tied to Russia, the reality is such that U.S. nuclear forces will likely continue to hover close to Russian levels, which will probably remain in the four-figure range.

China poses an additional planning concern. The Chinese have made clear their intention to augment their offensive strategic forces to counter any deployment of U.S. national missile defenses. How they might do so specifically has been left undefined but it could entail a significant increase in strategic nuclear warheads and delivery vehicles. Such a move would run counter to the overall downward trend in the nuclear forces of the other four original nuclear weapon states. Current U.S. plans call for retaining a large "responsive" reserve of strategic nuclear weapons to dissuade China or some other major power from seeking to achieve strategic nuclear peer status with the United States.

In this regard it is interesting to compare two viewpoints developed during the course of this project. One, in a proposal put forth by a prominent Chinese scholar, is that America's strategic nuclear weapons should not exceed the combined level of their Chinese, British, and French counterparts. The other viewpoint, expressed by a prominent French scholar, was that France had no interest in ever seeing China attain a larger strategic nuclear arsenal than the United States. While these two views are by no means mutually exclusive, they underscore the inherent uncertainties in U.S.-China strategic relations. They combine with yet another view expressed in the course of this project, namely that in seeking to hedge against a rising nuclear threat from China, the United States could be creating a self-fulfilling prophecy.

Another factor that weighs in favor of nuclear hedging, however, is the perceived need by the United States to hold out nuclear weapons as a deterrent to a rogue state's use of WMD. Such a threat was believed to have been effective in helping to discourage Saddam Hussein from using chemical or biological weapons in the First Gulf War. Despite the increasing lethality of conventional bunker-busting munitions, it will likely remain the case that some hardened and

deeply buried targets, such as regime command bunkers and WMD storage facilities, will remain largely impervious to all but nuclear munitions.

Against this backdrop, it would be overly optimistic to anticipate a draw-down of U.S. strategic nuclear weapons below the four-figure range in the near- to mid-term. This is not to suggest, however, that there is nothing to be learned from the British, French, and Chinese approach to nuclear deterrence at low levels of weapons. Indeed, one of the more prominent lessons, and one that might help pave the way to eventual adoption of a significantly smaller U.S. nuclear force posture, is to question the assumption in some U.S. circles that “minimum deterrence” by necessity means indiscriminately targeting civilian populations. The British and Chinese approaches offer an alternative perspective.

As noted above, during the first half of the 1950s, British targeting policy was focused on neutralizing Soviet offensive nuclear forces at the theater level. It was only after Britain concluded that it could not keep up with the growth in these forces that it abandoned its counter-force targeting scheme. Similarly, the design parameters for China’s missiles suggest that “soft” U.S. military bases in Asia have long been targets of interest to Beijing’s minimalist nuclear force. In essence, the presumption that lower levels of U.S. and Russian nuclear weapons rule out all but a counter-city targeting doctrine needs to be challenged by rigorous modeling and social science analysis. Such a reexamination should include analysts not previously involved in SIOP planning in order to help provide fresh perspectives.

Should U.S. counter-force targeting at low levels of nuclear weapons prove insufficient for deterrence or otherwise unworkable, however, other targeting strategies short of city-busting could be pursued. In later years, Britain attempted to more precisely define the sources of “Soviet state power” to make its nuclear targeting strategy more discriminate. Conceivably, future U.S. strategic nuclear delivery systems could attain significantly higher terminal accuracies and be combined with efficient low-yield nuclear weapons to produce the desired level of destruction with minimal collateral damage. Such capabilities might further erode the conception that lower levels of nuclear weapons are synonymous with urban targeting.

Another possible lesson from British, French, and Chinese experience is the potential for conducting nuclear planning in the absence of a publicly articulated threat. Before 1948, Britain refrained from publicly identifying the Soviet Union as a threat to its security. It was not until the late-1970s that France similarly named the USSR as its principal adversary. China continues to be circumspect in naming specific countries as threats to its security. This is not to suggest that detailed military planning does not take place quietly behind the scenes. While these countries were motivated, in part, by a desire not to antagonize their much larger and more powerful rivals, the lesson here seems to be that publicly saying less about targeting may be more conducive to reducing the overall saliency of nuclear weapons in international relations.

Drawing less public attention to nuclear planning must be reconciled, however, with the need to ensure clear private communication between and amongst nuclear powers. Here, the apparent cultural differences and unmet expectations of China-U.S. crisis signaling continue to be a significant cause for concern. While various Track II initiatives have sought to help bridge the gap in cross-cultural communication in the security realm, greater government-to-

government efforts will be needed to make any real progress. Naturally, the likelihood of such exchanges will be subject to the state of overall U.S.-China relations. Other members of the P-5 might try to engage China on these issues, as well.

Another potential lesson for the United States relates to the readiness levels of nuclear forces. It is interesting to note that with the end of the Cold War, Britain seriously considered discontinuing its practice of having at least one ballistic missile submarine on patrol at all times – a posture it has maintained uninterrupted since the Polaris force became fully operational in 1969. This proposal was rejected, however, out of concern that the return to a patrolling posture during a crisis could further exacerbate the situation. British defense officials similarly debated having any nuclear warheads on the Trident submarines. The Ministry of Defense concluded that de-mating warheads would not be in the best interest of the United Kingdom because this could similarly aggravate an existing situation if and when the warheads were moved back aboard the submarines. The British position underscores that even in the absence of a pressing security threat, reducing one's nuclear force readiness today could have a deleterious impact on crisis stability some years or decades down the road. This not only has implications for operational U.S. nuclear forces but also for the “responsive force” of reserve warheads. In particular, if the United States does not periodically practice the activation of some portion of the warhead reserve during peacetime, it could find itself politically constrained from doing so in a crisis for fear of escalating the situation. At a minimum, this suggests that U.S. military planners cannot take for granted the decision of the political leadership to activate these nuclear reserve weapons.

With regard to the second category of implications, the threats posed by rogue states with nuclear weapons have been addressed extensively in countless other reports and assessments. What this paper focuses on within that context are the U.S. defense planning implications specifically linked to a rogue state posture based on low levels of nuclear weapons. Here, the concept of “new minimalism” merits consideration. In essence, a variety of constraints and political goals may encourage rogue states to eschew some of the more overt and traditional approaches to low-level nuclear force development. They might, for example, “hover” for a considerable period of time in a non-weaponized state. This would enable them to minimize international condemnation and risk of preemptive attack while likely deriving some deterrent benefit from public speculation about their nuclear weapons potential. This posture seems to apply to North Korea’s at least until recently, and may also be what Iran has in mind.

Can the United States is to deny rogue states such a nuclear “half-way house?” To accomplish this, greater investments will be needed in intelligence capabilities and operations, as well as the political will to apply them more aggressively. In some key cases, covert action may be necessary to physically deny critical components to rogue states. More aggressive use of existing nonproliferation treaties should also form part of this more active denial strategy. In particular, the enhanced IAEA safeguards protocol developed in the wake of Iraq’s illicit nuclear weapons program remains voluntary for NPT member states. Notably, Iran has yet to adopt this protocol. Greater diplomatic pressure should be brought to bear to induce all NPT member states to implement these additional safeguards. Similarly, greater coordination should be undertaken amongst nuclear suppliers both within and outside the NPT to deny dual-use nuclear technology and components to rogue states even if they are technically in good standing within the NPT.

An important dimension of neutralizing the deterrent effect of limited rogue state nuclear capabilities is perception management. As suggested above, rogue states might conclude that the mere threat of only one nuclear bomb delivered against a U.S. city will suffice to paralyze the United States and help them to become nuclear powers on the cheap. The United States is pursuing capabilities to protect the U.S. homeland against the threat of such an attack. These programs need to be supplemented with an international public information campaign to help convince would-be attackers of the resiliency of American society. The intent of this campaign would be to deny rogues the easy victory they seek by undermining their confidence in their ability to deter the United States and forcing them to sink greater resources into their nuclear weapons programs.

Penetrating the deep concealment of rogue state nuclear capabilities will continue to be a major task for the United States. Considerable efforts are already underway in this area. While we will stand to learn valuable lessons regarding WMD concealment in Iraq, so too will other proliferators. The United States must balance the diplomatic need to validate its allegations of Iraq's possession of WMD with the risk of helping the remaining rogues improve their own deception and concealment techniques.

THE UNITED KINGDOM

*Gregory Giles*¹

Overview

Throughout the 1940s and 1950s, the United Kingdom pioneered many of the strategic concepts that came to define the nuclear weapons era. These early intellectual contributions tend to be overshadowed by later and more prolific American works, much as the United States built upon and then quickly surpassed Britain's early scientific lead in nuclear fission research. Yet the evidence of British foresight with respect to the theory and practice of nuclear strategy is well documented, thanks, in part, to the public release of many key British government and military reports from that period and their careful review by a number of British scholars.

The United Kingdom was the first country to grasp and act upon the potential of nuclear weapons. Indeed, as one American scholar has noted, without the groundbreaking work of Britain's Maud committee in 1940-1941, it is doubtful that the atomic bomb could have been completed before the end of World War II.² Scientists, soldiers, and politicians alike in wartime Britain provided some of the earliest thinking about the impact of nuclear weapons on international affairs. They were among the first to conclude that the only defense against atomic attack lay in the ability to deter it by threatening retaliation in kind. Consequently, Britain became the first country to base its national security strategy on the concept of nuclear deterrence, even before it possessed a credible nuclear strike force.

Because the United Kingdom came within reach of Soviet nuclear weapons well before the United States did, British strategists were the first to link the credibility of a deterrent with its survivability. Thus, Britain undertook pioneering studies of hardening fixed missile launch sites (although they were never built) and developed elaborate measures to ensure the pre-launch survivability of its renowned V-bombers. Likewise, British strategists were quick to recognize the coming of mutual vulnerability, as the Soviet Union built up its stocks of nuclear weapons and the means to deliver them against the continental United States. London appears to have grasped before Washington did that mutual vulnerability would undermine extended U.S. nuclear deterrence and so looked to its own nuclear force, in part, as a hedge against abandonment. Britain also was quick to reach conclusions about the marginal utility of additional nuclear weapons beyond a certain level of assured destruction. Further influenced by limited economic resources, the United Kingdom thereby became the first nation to adopt a posture of minimum nuclear deterrence, or “nuclear sufficiency” as it was called.

As the first to embrace the trip-wire strategy of massive nuclear retaliation, British strategists also were among the first to recognize its limits and to propose a more graduated response, a theme later echoed in the Flexible Response doctrine promoted by the Kennedy

¹ The author would like to thank Sir Michael Quinlan, former Permanent Under-Secretary of State in the British Ministry of Defense, who provided helpful comments on an earlier draft. The author retains sole responsibility for the contents of this chapter.

² Andrew J. Pierre, *Nuclear Politics: The British Experience With An Independent Strategic Force 1939-1970* (London: Oxford University Press, 1972) pp. 15, 22-23.

Administration. Other British innovations in the early nuclear era included articulation of the stability-instability paradox, counter-force targeting, dual-key controls over nuclear weapons, and recognition of the dangers of nuclear proliferation.

Because these were largely uncharted intellectual waters, the early history of British nuclear strategy is also replete with ambiguity and contradictions. This is to be expected. At the same time, British strategists demonstrated a single-mindedness about certain key precepts, such as the inherently political as opposed to warfighting value of nuclear weapons.

Another immutable concept at the heart of British nuclear strategy has been the necessity of tying the United States to the defense of Europe. Governments of both political parties consistently sought out intimate nuclear collaboration with Washington after the war to help solidify that linkage, and were largely unsuccessful until 1958. In creating a mechanism for, and then the habit of, high-level U.S.-U.K. nuclear consultation, Britain hoped to restrain any U.S. tendencies toward neo-isolationism, which could leave Britain alone to face aggression as it had from 1939-1941, or nuclear adventurism, which might pull Britain and Europe into an unwanted nuclear war with the Soviet Union.

The importance of this nuclear consultancy to overall British foreign policy is underscored by the degree to which the United Kingdom was willing to sacrifice traditional aspects of national sovereignty on its behalf. The historical record shows that over time Britain was at least willing to contemplate if not accept: limits on its stake in the as yet undetermined post-war commercial benefits of atomic energy; a U.S. veto over British personnel collaborating on the Manhattan Project; the risk of Soviet nuclear attack by hosting U.S. bomber bases; sacrificing its own supply of uranium to help the United States produce more atomic bombs; virtually giving up the indigenous production of nuclear weapons; delaying the construction of its own fissile material production facilities; delaying closer economic and strategic collaboration with Europe; and, subject to joint planning and British government approval, subordinating its own Bomber Command and later Polaris submarines to U.S. military direction in the event of war in order to achieve and then preserve close nuclear collaboration with the United States.

While Britain was quick to appreciate the transformational nature of nuclear weapons, it took longer to recognize that economically it could not keep up with the pace of scientific advancement demanded of nuclear powers, that is, it could not modernize its nuclear delivery systems without incurring unacceptable sacrifices in its non-nuclear forces. In part, this reflects a mismatch between Britain's limited post-war economic base and its far-flung global military commitments. Hence, there was a perhaps inevitable move to substitute nuclear firepower for "more costly" conventional weapons and manpower. Yet, even after initiating such a nuclear substitution scheme and a drastic scaling back of Britain's overseas commitments, London found that it could not afford to maintain its nuclear bomber force or develop a ballistic missile force of its own. This predicament only reinforced the importance of collaboration with the United States, as Britain came to rely heavily on U.S.-provided nuclear delivery systems. Before long, the strategic calculations underpinning the British nuclear deterrent were overshadowed by economic imperatives, as evidenced by the repeated scaling back of V-bomber production targets.

The relative ease with which London manipulated its nuclear force levels points to another theme in British nuclear strategy. Namely, that the credibility of deterrence is in the eyes of the beholder. Influenced, in part, by Winston Churchill's personal views that the "art" of nuclear deterrence was more important than the actual "article," Britain did not exactly adopt a "crash" program to build nuclear weapons. In fact, it took Britain 5 years to move from the formal "go" decision to its first nuclear test. This was hardly a standing start either, given Britain's participation in the Manhattan Project. Before long, many in the government and military came to appreciate that Britain not only needed the article, but a credible (i.e., survivable) one at that. Accordingly, billions of pounds were spent over the ensuing decades to help ensure that a significant portion of Britain's nuclear forces could survive a surprise attack and still reach their intended targets. Yet, the history of the British nuclear deterrent is colored by episodes where the credibility of the deterrent was open to question.

For example, while Britain managed to deploy its first nuclear-armed bombers just prior to the 1956 Suez crisis, the limited number and reach of those aircraft were not sufficient to deter Soviet Prime Minister Bulganin from threatening the United Kingdom with nuclear rocket attack.³ Similarly, the British government did nothing to correct public impressions that its initial H-bomb tests were successful, even though it knew that they had failed to achieve megaton yields. In later years, a "deterrence gap" was opened during which the ability of the V-bombers to penetrate Soviet air defenses was increasingly put in doubt. This gap endured from 1965-1969 until the third Polaris submarine became operational and the Royal Navy relieved the Royal Air Force of its strategic deterrence mission. Even then, the Polaris force was not above question. The first Polaris submarine, for example, reportedly made its maiden patrol in 1968 with less than a full complement of warheads due to a production bottleneck. Because the Labor Government of Harold Wilson canceled a fifth Polaris submarine, had one of the remaining four submarines been taken out of service, Britain would have been hard-pressed to keep a single Polaris submarine on station at all times. All of this suggests that Britain's deterrent at times relied more on whether the Soviets were certain that British nuclear forces could not get through to their targets – a highly risky proposition – rather than its own certainty that they could. The overarching U.S. nuclear umbrella presumably compensated for Britain's deterrence gaps in any event.

Issues of morality do not appear to have been very far from British nuclear thought, although the evidence suggests that official policy has been driven more by pragmatism. Still, there is ample reason to believe that the British Government has never been completely comfortable with the prospect of having to use nuclear weapons, even in retaliation. Britain's adoption of nuclear deterrence appears to have been made reluctantly; on balance it was considered preferable to other paradigms and possible outcomes.

³ Sir Michael Quinlan points out, however, that Bulganin's threat was not taken seriously at the time by the British Government.

I. Origins and Early Development of British Nuclear Strategy, Doctrine, and Force Posture

A. Motives and Assumptions

The origins of British nuclear strategy in some sense predate even the critical pioneering work of the wartime Maud committee, which concluded in July 1941 that atomic weapons were feasible and should be produced as soon as possible. At the dawn of the 20th century, British scientists and universities were at the forefront of experimental physics. While these scientists generally were loathe to forecast when and how “atomic energy”⁴ might be applied, they did express their concerns as early as the 1910s and 1920s that the atom would ultimately be used to make more destructive weapons. British novelists, playwrights and other observers expanded on this theme, and many works of this period included the lethal use of atomic energy.⁵ Indeed, in 1925 Winston Churchill portrayed a nuclear future that bore a striking resemblance to later events he helped instantiate:

Might not a bomb no bigger than an orange be found to possess a secret power to destroy a whole block of buildings – nay to concentrate the force of a thousand tons of cordite and blast a whole township at a stroke? Could not explosives of this type be guided automatically in flying machines by wireless or other rays, without a pilot, in ceaseless procession upon a hostile city?⁶

So in contrast, for example, to the United States where there was positive enthusiasm for the potential of atomic energy, the collective British consciousness tended to see dread.⁷ This culture of pessimism would color the views of the British military planners and statesmen who would have to come to grips with the implications of nuclear weapons.

Having concluded that an atomic bomb was feasible, the Maud Committee also pointed to related scientific research underway in Germany and thus raised the specter that Hitler might get there first. This threat provided a major impetus to Britain’s decision to develop the bomb. In a letter to Prime Minister Churchill, Lord Cherwell, a scientific advisor and close confidant, concluded:

...I am quite clear that we must go forward. It would be unforgivable if we let the Germans develop a process ahead of us by means of which they could defeat us in war or reverse the verdict after they had been defeated.⁸

British intelligence maintained a close watch on German nuclear research throughout the war. Britain also destroyed Norway’s heavy water facility to physically deny its output to Germany. By 1943, however, it became clear that German A-bomb research greatly lagged behind the

⁴ This term was coined and popularized by British scientists Ernest Rutherford and Frederick Soddy. See Kirk Willis, “The Origins of British Nuclear Culture, 1895-1939,” *Journal of British Studies*, no. 34, January 1995, p. 64.

⁵ *Ibid.*, pp. 59-89.

⁶ Ironically, Churchill would deliberately downplay the possibility of a German “uranium bomb” in 1939 so as not to further encourage appeasers in the Chamberlain Cabinet. See Pierre, *op. cit.*, p. 11, n. 1 and pp. 12-13.

⁷ Willis, *op. cit.*, pp. 88-89.

⁸ Quoted in Margaret Gowing, *Britain and Atomic Energy, 1939-1945* (St. Martin’s Press), p. 96.

Manhattan Project. This did not lead to any slackening in the Allied effort, however, since the intent was to produce an atomic bomb for use in the war, which still raged in Europe and Asia.

Britain had other incentives to attain the atomic bomb. As the Maud report noted, “[e]ven if the war should end before the bombs are ready the effort would not be wasted, except in the unlikely event of complete disarmament, since no nation would care to risk being caught without a weapon of such decisive possibilities.”⁹ A 1945 assessment by Britain’s Joint Intelligence Committee concluded that the United States was capable of producing 50-60 bombs per annum, the USSR 5 in about 4 years, Canada, Belgium, and Holland 5 in five years, and Sweden 5 in about seven years.¹⁰ In short, the atomic bomb was being viewed in London as the new capital weapon, much as the battleship had been. Given the historic importance of the capital weapon to Britain’s military strategy, it was simply to be assumed that she would attain the latest version.¹¹ While there were some dissenters in the scientific and military ranks (see below), formalization of the government’s “decision” to build Britain’s first atomic bomb thus came only in 1947, almost as an afterthought.

Another motivation that drove British acquisition of the atomic bomb was concern that after the war, the United States would once again lapse into isolationism, as it had after the First World War, leaving Britain to keep the peace in Europe. This concern was expressed in an initially great reluctance by the British to jointly pursue the atom bomb with the United States and to building the first fissile material production facilities in America. Again quoting Cherwell, “However much I may trust my neighbor, and depend on him, I am very much averse to putting myself completely at his mercy and would therefore not press the Americans to undertake this work.”¹²

Coexisting uncomfortably with doubts about U.S. reliability was the British recognition that American participation was essential to counter the emerging Soviet threat. As the British Chiefs of Staff wrote in April 1946:

“...recent developments make it appear that Russia is our most probable potential enemy, far more dangerous than a revived Germany....In a conflict with Russia, the early and whole-hearted participation of the United States on our side would be vital.”¹³

This inescapable tension lay at the heart of subsequent British nuclear strategy, which foremost sought to conduct deterrence in concert with the United States, whilst simultaneously planning to face nuclear threats on its own, if necessary.

⁹ Report by the Maud Committee on the Use of Uranium for a Bomb, Ministry of Aircraft Production, July 1941, excerpted in J.B. Poole, *Independence and Interdependence: A Reader on British Nuclear Weapons Policy* (London: Brassey’s, 1990), p. 17.

¹⁰ Clark and Wheeler, *op. cit.*, p. 57.

¹¹ Robert H. Paterson, *Britain’s Strategic Nuclear Deterrent: From Before the V-Bomber to Beyond Trident* (London: Frank Cass & Co., Ltd.: 1997), p. 14.

¹² Gowing, *op. cit.*, p. 97.

¹³ Ian Clark and Nicholas J. Wheeler, *The British Origins of Nuclear Strategy 1945-1955* (Oxford: Clarendon Press, 1989), p. 115.

B. Threat Perceptions

The 1946 report by the Chiefs of Staff provided an early, but by no means the earliest, indicator of emerging British threat perceptions. As one British historian has noted, Britain has feared Russia since at least the mid-19th century, as a potential challenger to her imperial position.¹⁴ That fear was compounded by the anti-capitalist orientation of the Soviet Union. While Britain and the USSR were wartime allies, the relationship was marked by mistrust. As early as 1943, therefore, Churchill privately acknowledged to U.S. officials that Britain was interested in the bomb to hedge against what it saw as the eventual prospect of Soviet nuclear blackmail.¹⁵ Publicly, the British government was not prepared to go that far. The Foreign Office, in particular, did not wish to further exacerbate growing tensions with Moscow and so the military was not “formally” permitted to name the Soviet Union as the potential enemy until the end of 1947.¹⁶

The British military’s assessment of the Soviet threat varied over time. Initial post-war assessments were indecisive about Soviet intentions and lacked hard information on capabilities. Writing in 1947, the Chiefs of Staff argued that:

The belief is held by some that, through fear of the atomic bomb, Russia will recoil from war until she herself has modern weapons. On the other hand, it can be argued that she might come to the conclusion that in the scientific race she was increasingly outstripped and that it was to her advantage to strike before the odds against her became too great....On present intelligence and scientific advice, we agree that there is little or no possibility of atomic attacks on this country before 1952. Between 1952 and 1957, a possibility of attacks with weapons of mass destruction exists, but for a variety of reasons we think the chances are slight. After 1957, this form of attack is a distinct possibility.¹⁷

Five years later, in the then top secret Global Strategy Paper, the Chiefs of Staff concluded that:

...for Russia, the best opportunity for using war as a means of furthering her aims has already passed and she is unlikely to do so unless she is led to believe that she is about to be attacked or is unbearably provoked by rash and precipitate action...it now seems to us that provided the great deterrent of atomic attack is kept in being together with the increased strength of Western Europe, the likelihood of war is more remote than it was thought two years ago...

¹⁴ Beatrice Heuser, *Nuclear Mentalities? Strategies and Beliefs in Britain, France and the FRG* (New York: St. Martin’s Press, Inc., 1998), 6.

¹⁵ Lawrence Freedman, Martin Navias, Nicholas Wheeler, “Independence in Concert: The British Rationale for Possessing Strategic Nuclear Weapons,” *Nuclear History Program Occasional Paper 5*, Center for International Security Studies at Maryland School of Public Affairs, University of Maryland, 1989, p. 11.

¹⁶ John Baylis, *Ambiguity and Deterrence: British Nuclear Strategy 1945-1964* (Oxford: Clarendon Press, 1995), pp. 60-63. See also, Clark and Wheeler, *op. cit.*, pp. 55-65.

¹⁷ Clark and Wheeler, *op. cit.*, pp. 61-62.

Still, the Chiefs believed that if war did break out, Russia would likely, "...concentrate on trying to overrun Western Europe, including Spain....She would also try to gain control of Turkey, and to knock out the United Kingdom with atom bombs..."¹⁸

While the likelihood of conflict with the USSR varied in the eyes of the British military there were important continuities in the specific types of threats the British perceived and accordingly sought to deter. Chief among these was the Soviet Union's use of nuclear weapons against Britain's cities. The vast increase in the destructive power brought about by atomic weapons served to exacerbate historic British fears about vulnerability to air bombardment. An assessment prepared by the Chiefs' Joint Planning Staff observed that about 42 percent of Britain's population lived in cities of over 100,000 inhabitants, compared to 31 percent for the United States and only 14 percent for the Soviet Union. This led the planners to conclude that, 'this country is more vulnerable to weapons of mass destruction than either of the other great powers.'¹⁹ A 1946 report by the Joint Technical Warfare Committee concluded that, "some 30 to 120 atomic bombs accurately delivered by the USSR might cause the collapse of the United Kingdom without invasion..."²⁰

The advent of the much more destructive thermonuclear or H-bomb exacerbated the vulnerability issue greatly. The government's 1955 Strath Report detailed the damage Britain would suffer from as little as 10 Soviet H-bombs. This included 12 million fatalities and an additional 4 million serious casualties, the destruction of half of Britain's industrial capacity, a breakdown of the distribution system and utilities, and widespread food and water contamination.²¹ All told, Britain's remaining 40 million survivors would be left living in siege conditions, from which they might never recover. It is thus not surprising that concerns about public reactions to the H-bomb threat led Churchill to ask the BBC not to broadcast discussions of the subject.²²

British planners also were concerned that the Soviet Union might seek to bring Britain to its knees by maritime strangulation. Such was the concern that the Soviet Union might smuggle a nuclear weapon into a British port, what the Global Strategy Paper referred to as a "Trojan Horse" attack, that the first British nuclear device ever tested was set off in the hull of a ship to measure the likely effects on British ports.²³

Another major concern of British planners and politicians alike was the presence of U.S. B-29 bombers in East Anglia, beginning in 1948 in response to the Berlin crisis. Indeed, Moscow had taken to calling Britain America's "Airstrip One." A 1950 Foreign Office assessment concluded that the American bomber presence would indeed, "...increase the

¹⁸ This declassified paper is reprinted in its entirety in Alan MacMillan and John Baylis, "A Reassessment of the British Global Strategy Paper of 1952," *Nuclear History Program Occasional Paper 8*, Center for International and Security Studies at Maryland School of Public Affairs, University of Maryland, 1994. See pp. 28-30.

¹⁹ Clark and Wheeler, *op. cit.*, p. 77.

²⁰ Baylis, *op. cit.*, pp. 50-51.

²¹ *Ibid.*, p. 190.

²² Richard Gott, "The Evolution of the Independent British Deterrent," *International Affairs*, vol. 39, no. 2, April, 1963, p. 238.

²³ Clark and Wheeler, *op. cit.*, p. 172.

likelihood of [Britain] becoming a primary target for any Russian attack..." but concluded that this was the price to be paid to "...keep the United States firmly committed to Europe."²⁴

C. Political Factors

Among the various political factors that have shaped British nuclear strategy over the decades, two deserve elaboration. The first of these is Britain's desire for prestige. The other is the nature of Anglo-American relations. In reality, the two are very closely linked.

As indicated above, British leaders and strategists widely assumed that the United Kingdom would become a nuclear power owing to its great power status. Because this relationship was simply assumed, British officials did not feel it necessary to publicly justify it. Hence, it was mainly during the rare bouts of controversy involving the nuclear deterrent that British leaders from both parties thought it necessary to invoke national prestige arguments. In making the case to the Cabinet for proceeding with the H-bomb, Churchill in July 1954 claimed that, "we could not expect to maintain our influence as a world power unless we possessed the most up-to-date weapons."²⁵ This desire to remain a part of the nuclear power "club" had been aired by Churchill to Canadian ministers a few days earlier.²⁶ This theme was echoed by a government spokesman in Parliament in 1957:

...if we still have visions of retaining influence in the world, if we still have visions of ourselves as the center, if no longer the mother of the great commonwealth of nations, and if we see ourselves influencing the circumstances in which the deterrent might be used, I do not see how we can do without [the H-bomb].²⁷

Indeed, Prime Minister Harold Macmillan drew historic parallels to an earlier "Elizabethan Age," when Britain lacked all the resources of the greatest powers but still played an influential role internationally. In essence, Macmillan believed that thermonuclear weapons could help compensate for other limitations and enable Britain to aspire to greatness.²⁸

Following his tenure as a Labor Prime Minister, Clement Attlee expressed his support for a British H-bomb based on his own belief that Britain was held in higher regard internationally because it possessed nuclear weapons:

I think we have influence in the world. That influence does not depend solely upon the possession of [nuclear] weapons, although I have found that the fact we do possess these weapons does have an effect upon the rulers of other countries. It is quite an illusion to think that it does not have an effect.²⁹

To be certain, there were dissenters within the official ranks. In 1958, Peter Thorneycroft resigned as Chancellor of the Exchequer, observing that expenditure on nuclear weapons was,

²⁴ Wheeler, *op. cit.*, p. 72. See also, Macmillan and Baylis, *op.cit.*, p. 30

²⁵ Quoted in Clark and Wheeler, *op. cit.*, p. 214.

²⁶ Lorna Arnold, *Britain and the H-Bomb* (Hounds Mills, Basingstoke, Hampshire: Palgrave, 2001), p. 54.

²⁷ Pierre, *op. cit.*, p. 103.

²⁸ *Ibid.*, p. 176.

²⁹ *Ibid.*, p. 103.

“...a questionable policy...our prestige will be rated not by the bombs we make nor the money we can spend but by the contribution we make to western solvency and economic strength.”³⁰ Sir Henry Tizard, Chairman of the Defense Research Policy Committee and nuclear weapons opponent, even more sharply rebuked the prestige rationale:

We are not a Great Power and never will be again. We are a great nation, but if we continue to behave like a Great Power we shall soon cease to be a great nation. Let us take warning from the fate of the Great Powers and not burst ourselves with pride.³¹

Tizard’s views did find some support within the Ministry of Defense, but not amongst the more influential Chiefs of Staff. What stands out from the debate as to whether nuclear weapons conferred prestige on Britain is the generality of the arguments. In looking for greater specificity, one finds ample evidence to conclude that the main target of Britain’s nuclear influence was not the Soviet Union, but its friend and ally, the United States.

While Britain certainly saw itself as one of the “Big Three” post-war great powers, it also recognized, as noted above, that it could not hope to keep the Soviet Union at bay by itself. With Western Europe only slowly recovering from the war, the inescapable conclusion was that Britain must maintain close relations with the United States, to ensure that it would come to Britain and Europe’s defense when needed, as well as to dissuade Washington from rash behavior that might otherwise precipitate a war with the Soviet Union.

The theme of influencing U.S. foreign policy and nuclear strategy runs continuously throughout Britain’s nuclear history. In making the case for Britain’s decision to produce its own atomic bomb, the Foreign Secretary Ernest Bevin remarked that, “we could not afford to acquiesce in an American monopoly on this new development.”³² The military echoed this view, noting in the 1952 Global Strategy Paper, for example, that:

At present the Atomic Air Offensive rests entirely in American hands...We feel that to have no share in what is recognized as the main deterrent in the Cold War, and the only allied offensive in world war, would seriously weaken British influence on American policy and planning in the Cold War, and in war would mean that the United Kingdom would have no claim to any share in the policy or planning of the offensive.³³

This thinking carried over into the H-bomb realm, as well. According to Churchill, if Britain had the H-bomb, the Americans would respect Britain’s intervention in world affairs far more than if it did not.³⁴ The Chiefs of Staff added in 1954 that, “it would be dangerous if the United States were to retain their present [H-bomb] monopoly since we would be denied any right to influence her policy in the use of this weapon.”³⁵

³⁰ Paterson, *op. cit.*, p. 53.

³¹ Baylis, *op. cit.*, p. 86.

³² John Simpson, *The Independent Nuclear State: The United States, Britain, and the Military Atom* (New York: St. Martin’s Press, 1983), p. 46.

³³ Macmillan and Baylis, *op. cit.*, pp. 48-49.

³⁴ Arnold, *op. cit.*, p. 54.

³⁵ Freedman, Navias, and Wheeler, *op. cit.*, p. 13.

The near-absolute priority that Britain attached to this strategy of nuclear consultancy with the United States is underscored by the degree to which it was willing to compromise on traditional measures of national sovereignty. Whereas Britain was initially reluctant to countenance any infringements on its nuclear independence, history records the following compromises:

- To allay concerns that Britain's involvement in the Manhattan Project was motivated by a desire to reap commercial benefits, Churchill ceded to President Roosevelt the full authority to determine what share of the post-war economic rewards of atomic energy Britain would receive.³⁶
- To further reassure the United States of Britain's disinterest in the commercial benefits of atomic energy, and at Washington's insistence, Britain's choice to liaise with the Manhattan Project, William Akers, had to be reassigned due to his links with Britain's chemical industry.³⁷
- To underscore its commitment to the Manhattan Project's goal of building an atomic bomb for use in the war, Britain drastically scaled back the atomic research it was carrying on at home.³⁸
- In 1946, the Royal Air Force agreed to a U.S. Air Force proposal to host the latter's nuclear-armed B-29 bombers at British bases in times of crisis, thus inviting Russian attacks on Britain.³⁹
- Under the *modus vivendi* understanding, Britain relinquished to America all of its uranium ore production for 1948 and 1949, as well as two-thirds of its on-hand uranium.⁴⁰
- In 1949, Britain signaled its willingness to consider virtually giving up indigenous production of nuclear weapons in return for the storage of American atomic bombs in Britain under London's control.⁴¹
- Hoping to still reach a deal with America along the lines of the 1949 negotiations, Churchill delayed starting the construction of new reactors at Calder Hall, thus inhibiting Britain's own fissile material production.⁴²

³⁶ Gowing, *op. cit.*, pp. 167-168

³⁷ *Ibid.*, pp. 172-173.

³⁸ *Ibid.*, p. 321.

³⁹ Clark and Wheeler, *op. cit.*, p. 116.

⁴⁰ In return, American agreed to exchange some nuclear-related information with Britain but none relating to nuclear weapons. Simpson, *op. cit.*, p. 79. See also, Pierre, *op. cit.*, p. 128.

⁴¹ London also insisted on keeping a small ability to conduct nuclear weapons work in Britain. A deal with America along these lines collapsed in the wake of the Klaus Fuchs nuclear spy scandal. Pierre, *op. cit.*, p. 133. See also, Simpson, *op. cit.*, p. 83.

⁴² Simpson, *op. cit.*, pp. 87-88.

- In seeking to acquire the Polaris nuclear delivery system from the United States, Macmillan alienates French President Charles de Gaulle, who subsequently denies Britain's pending application for entry into the European Common Market.⁴³
- As a condition for acquiring Polaris, Macmillan agrees that Britain will subordinate the force to the U.S. Supreme Allied Commander for Europe.⁴⁴

For all these sacrifices, the extent to which Britain succeeded in influencing American foreign and nuclear policy is subject to debate. Under the terms of the 1943 Quebec Agreement, for example, British consent was required for America's use of nuclear weapons against Japan. Yet, because the United States had invested so disproportionately in the success of the Manhattan Project, Churchill did not believe it politic to assert Britain's rights, he himself having no hesitation on the use of the bomb. Thus, U.K. consent to the Hiroshima and Nagasaki attacks was given pro forma.⁴⁵

In response to President Harry Truman's public warning in 1950 that he was prepared to use nuclear weapons in the Korean War, Prime Minister Attlee immediately flew to Washington, to counsel restraint. Even though Britain's right of consent in the use of U.S. nuclear weapons had been rescinded in the *modus vivendi* agreement, Attlee managed to secure from Truman a verbal assurance that the United States would not use the bomb without prior consultation with Britain.⁴⁶ The Attlee mission is widely cited as evidence that Britain's strategy of nuclear consultancy was valid. Yet, it is important to note that Anglo-American nuclear cooperation was minimal at the time, Britain was still two years away from detonating its first nuclear device, and the U.S. military, for its part, apparently had no desire to use nuclear weapons in the Korean conflict.⁴⁷

This agreement to consult with the British on possible U.S. nuclear use witnessed uneven application in subsequent years. On the one hand, Britain was given prior notice that the United States would not use nuclear weapons to assist beleaguered French forces at Dien Bien Phu in 1954.⁴⁸ On the other hand, Britain was "informed but not consulted" by the United States during the Cuban Crisis, much to London's consternation and despite a June 1962 "gentleman's agreement" between Kennedy and Macmillan to consult on nuclear crises.⁴⁹ Outright U.S. opposition to Britain's moves against Egypt during the 1956 Suez crisis is well known, a position ironically taken just as Britain's nuclear deterrent force had become an operational reality.

⁴³ It appears that de Gaulle was predisposed to deny Britain's application and that Nassau provided a convenient rationale. Pierre, *op. cit.*, pp. 222-240.

⁴⁴ Macmillan insisted, however, on an escape clause that enabled Britain to withdraw the force from U.S. control, "where her Majesty's Government may decide that supreme national interests are at stake." Pierre, *op. cit.*, p. 236-237. A promise by the RAF to place its Bomber Command under direct U.S. control in the event of war had been made as early as 1948. Baylis, *op. cit.*, p. 114.

⁴⁵ Gowing, pp. 370-373.

⁴⁶ Clark and Wheeler, *op. cit.*, p. 140.

⁴⁷ *Ibid.*

⁴⁸ Beatrice Heuser, *NATO, Britain, France and the FRG: Nuclear Strategies and Forces for Europe, 1949-2000* (New York: St. Martin's Press, Inc., 1999), p. 64.

⁴⁹ Pierre, *op. cit.*, pp. 136, n. 3, 224-225.

Britain seems to have fared better with respect to influencing certain U.S. arms control positions and nuclear strategies. Chief among these is Britain's role in facilitating the 1963 Partial Test Ban Treaty (PTBT). After stalling negotiations with the Soviet Union and the United States on a nuclear test moratorium in 1957 in order to complete its own H-bomb, Britain subsequently joined the moratorium and worked hard to get the Americans to uphold it. When the United States required access to Britain's nuclear test site on Christmas Island to resume atmospheric testing in 1962, Harold Macmillan was able to win American acceptance of the PTBT as a quid pro quo.⁵⁰

Britain was able to exercise disproportionate influence in winning American and NATO acceptance of the strategy of massive nuclear retaliation, in effect diluting the 1952 Lisbon Agreement to increase NATO's conventional forces. The United Kingdom likewise managed to derail or otherwise dilute American nuclear proposals that conflicted with British interests, such as the Multi-Lateral Force. In the early-1960s, London resisted the U.S. push for a doctrine of "flexible response," and managed to retain within the concept a lower nuclear threshold than the Americans would have preferred.⁵¹

While the scorecard of British influence may be mixed, in the view of former Secretary of State Henry Kissinger, London's strategy and the subtle manner in which it was pursued did pay off:

[Britain's strategy] involved a pattern of consultation so matter-of-factly intimate that it became psychologically impossible to ignore British views. They evolved a habit of meetings so regular that autonomous American action somehow came to seem to violate club rules...It was an extraordinary relationship because it rested on no legal claim; it was formalized by no document; it was carried forth by succeeding British governments as if no alternative were conceivable. British influence was great precisely because it never insisted on it.⁵²

As suggested above, Britain's pursuit of close strategic ties with America often came at the expense of European collaboration, particularly with regard to France. Indeed, U.S. misgivings about the involvement of refugee French scientists in the British wartime atomic energy program and London's commitment under the Quebec Agreement not to share atomic weapons knowledge without U.S. consent forced the British government to back off of prior assurances to the Free French that they could share in the results after the war.⁵³ Britain's stance toward the French remained colored by the constraints of potential or actual Anglo-American nuclear cooperation well into the post-war period. Thus, in 1954, Britain turned down a French government request for assistance in building a gaseous diffusion facility, anxious not to perturb Washington.⁵⁴

⁵⁰ Simpson, *op. cit.*, p. 160-162.

⁵¹ Pierre, *op. cit.*, pp. 259-260. See also, Heuser, *Nuclear Mentalities*, p. 3 and Baylis, *op. cit.*, pp. 331-334.

⁵² Simpson, *op. cit.*, p. 160.

⁵³ Gowing, *op. cit.*, pp. 209-215, 342-346.

⁵⁴ Simpson, *op. cit.*, p. 121.

In effect, Britain assessed that the prospects for a unified and strong Europe were dim after the ravages of the Second World War.⁵⁵ Rather, London pinned its hopes on the solidarity of NATO, underwritten ultimately by the U.S. nuclear guarantee. As France independently moved closer to its own nuclear weapons capability, Britain's response was ambivalent. Harold Macmillan remarked in 1963, "I can understand why the French Government, who are a world Power as well as a continental Power, wish to develop their own nuclear force. I must frankly say that I hope they will accept that such a force has obligations as well as rights."⁵⁶ Certainly, Macmillan was courting France as Britain sought entry into the Common Market, and he apparently implied that Anglo-French nuclear collaboration was in the offing. Yet, in the end, Macmillan's preferences remained with Anglo-American cooperation. Indeed, it has been suggested that Britain was playing the "French card" as a means of striking a better deal with the Americans on nuclear delivery systems.

The successor Labor government of Harold Wilson demonstrated greater sensitivity toward the French during its attempt to win entry into the Common Market. Despite growing concerns about the ability of Britain's Polaris missiles to penetrate the missile defenses being installed around Moscow, Wilson opted to not seek the more capable Poseidon missile from the United States, hoping to persuade President de Gaulle that Britain was reducing its reliance on America.⁵⁷ The return of a Conservative government under Edward Heath in 1970 held out the prospect for greater Anglo-French collaboration, but it did not live up to expectations given the American imperative and France's absence from NATO's consultative councils.⁵⁸

D. Economic Factors

Ever since Britain embarked upon the path to the military atom, perhaps no force would have greater bearing on her aspirations than economics. The enormous strains of the wartime economy initially prohibited Britain from building the A-bomb on her own soil and forced her into a collaborative relationship with the United States. We can only speculate how Britain's role in international politics might have differed if she had the economic wherewithal to get the bomb first and on her own.

Britain was then denied an opportunity to restore her economy after the war due to the outbreak of the Korean conflict. To reassure the United States that Britain was willing to help shoulder the burden of Cold War collective security, it subsequently launched a major conventional rearmament campaign. Before long, however, Britain realized that it could not afford to carry out that plan. Nor could it honor its commitments taken at Lisbon in 1952 to increase its conventional forces committed to NATO. It was perhaps inevitable that these economic pressures would compel the United Kingdom to look towards nuclear weapons as a substitute for more costly conventional forces and personnel.⁵⁹

⁵⁵ The idea of Britain coalescing Western Europe into an independent "Third Force" between the Soviet Union and Russia was briefly entertained and then abandoned by the Foreign Office.

⁵⁶ Poole, *op. cit.*, p. 107.

⁵⁷ Freedman, *op. cit.*, p. 39.

⁵⁸ *Ibid.*, pp. 42-43.

⁵⁹ Clark and Wheeler carefully point out, however, that an explicit trade-off between nuclear and conventional armaments is not reflected in British thinking during or immediately after Second World War. Speaking to

The pressure to keep military spending down to permit Britain's civilian export industries to recover was perhaps first reflected in the 1952 Global Strategy Paper. As acknowledged by the Chiefs of Staff, their:

review of British global strategy originated in instructions from the Minister of Defense to reconsider the United Kingdom rearmament program on the assumption that it would be necessary for economic reasons to accept drastic cuts in planned defense expenditure in the coming years...While such reductions in defense expenditure inevitably involve serious risks, we consider that there was in any event a strong case for a review of Allied strategy on a more realistic basis, and taking account of recent military and political developments.⁶⁰

Foremost among those developments, was the growth of America's long-range nuclear strike capability. Accordingly, while the Chiefs warned that the Cold War would necessitate a high level of sustained military readiness and spending, and that conventional forces still had a significant role to play, cuts in the forces could be accepted by placing a relatively higher emphasis on nuclear forces as the main deterrent to war with the Soviet Union.

Britain's financial situation failed to improve, however, largely the result of the continuing mismatch between the country's global aspirations and its slim economic base. To illustrate, between 1955 and 1970, Britain devoted on average 6.4 percent of its GDP to defense compared to 5.6 percent for France, 3.9 percent for West Germany, and 3.2 percent for Italy. For the period 1950-1970, Britain's share of world manufacturing exports, a key segment of its economy, dropped from 25.5 percent to 10.8 percent. The Korean rearmament program had a particularly deleterious effect on the British economy. Industrial production rose by less than one percent between 1950 and 1952 compared to 30 percent between 1947 and 1950. The diversion of skilled workers to defense projects also helped stifle Britain's economy. By 1956-1957, some 40 percent of the country's scientists and engineers in research and development were working on military projects.⁶¹

With the Chiefs of Staff continuing to debate amongst themselves the proper balance of nuclear and conventional forces that should be sought, Minister of Defense Duncan Sandys took a more proactive role in reducing military expenditures. As reflected in the 1957 Defense White Paper, Sandys placed yet greater emphasis on Britain's nuclear deterrent, which in turn enabled Britain to end conscription and free up manpower to rebuild the economy.⁶²

The economic benefits of a greater reliance on nuclear deterrence remained illusory, so long as Britain insisted on maintaining its security presence and commitments east of Suez.

Parliament in 1945, Churchill remarked that, "those who argue that because of the atomic bomb, there is no need for armies, navies, and air forces, are at present 100 percent wrong." *Op. cit.*, pp. 25-30, 87.

⁶⁰ Macmillan and Baylis, *op. cit.*, p. 43.

⁶¹ Paterson, *op. cit.*, p. 47.

⁶² Michael D. Kandiah and Gillian Staerck, editors, *The Move to the Sandys White Paper of 1957*, Institute of Contemporary British History Witness Seminar Program, 1988. According to Sir Richard Powell, Deputy Secretary, Ministry of Defense, 1950-1956, the Sandys White Paper was not driven solely by economic concerns but also an appreciation of the transformational nature of nuclear weapons. See also, Lawrence W. Martin, "The Market for Strategic Ideas in Britain: The 'Sandys Era,'" *The American Political Science Review*, vol. 56, no. 1, March 1962, pp. 23-41.

Thus, even the nuclear bomber force felt the economic pinch. In 1954, the V-bomber force was planned at 240 aircraft. By 1958, that figure was reduced three times, largely due to economic pressure, to 144 bombers.⁶³

Not foreseen at the time were the skyrocketing costs that would have to be incurred to keep Britain's emerging force of V-bombers effective in the face of advances in Soviet air defenses and long-range ballistic missiles. While Britain was developing its own ballistic missile, the Blue Streak, concerns about the vulnerability of its fixed launch mode as well as spiraling costs prompted the Government to cancel the project in favor of acquiring the Skybolt missile from the United States. Skybolt was a ballistic missile that would be carried aloft by a bomber and then launched against a target from a relatively safe stand-off range. When the United States informed Britain on December 11, 1962 that it had decided to cancel Skybolt, the future of the British deterrent was placed in doubt until Prime Minister Macmillan and President Kennedy expeditiously negotiated a deal on the Polaris submarine launched ballistic missile a week later.

The shift from the V-bombers to Polaris had a significant ameliorating effect on Britain's defense budget. Whereas the strategic nuclear bomber force accounted for as much as 15-20 percent of the defense budget in the mid-1960s, after Polaris took over the strategic deterrence mission that amount was reduced to less than 2 percent in 1970.⁶⁴ What helped make the Polaris so cost-effective to Britain was that the United States relieved it of paying all but a token amount towards the research and development costs of the system. The very favorable terms upon which Polaris was procured and its low operating costs helped counteract domestic political pressures, particularly within the Labor party, to consider relinquishing Britain's nuclear deterrent (see below).

As noted, political pressures in British-French relations militated against upgrading Polaris in a high profile fashion. Rather than engage the Americans in switching to the Poseidon missile, which had multiple independently targeted warheads, Britain opted to upgrade Polaris under the Chevaline project. Chevaline experienced significant cost-overruns, with an estimated total cost of one billion pounds.

Britain's uphill battle to retain a viable nuclear delivery system underscored the high costs of going it alone in the face of rapidly advancing technologies. Reliance on U.S.-built delivery systems proved an attractive alternative for economic and political reasons. However, the Skybolt and Chevaline episodes convinced Britain of the necessity of remaining in lock-step with the United States on the very latest delivery systems. This lesson helped shape Britain's later decision to adopt the Trident D-5 missile.

E. Morality

Issues of morality do not appear to have been very far from British nuclear thought, although the evidence suggests that official policy has been driven more by pragmatism. Initially, the morality of developing nuclear weapons was not a major concern of Britain's

⁶³ Baylis, *op. cit.*, pp. 173-174, 224, 248.

⁶⁴ Pierre, *op. cit.*, p. 296, n. 1.

scientists and government officials. Presumably the imperative of war and the focused pursuit of science were overriding factors.⁶⁵ As noted, Churchill personally had no hesitation in the use of the atomic bomb against Japan.

The 1954 decision to build the H-bomb did see the morality issue discussed by the full Cabinet. The Cabinet concluded that the decision to build the H-bomb was no different morally than the decision to build the atomic bomb. The Cabinet did, however, draw a distinction between building H-bombs, which was ethically acceptable in order to deter war, and using them if deterrence failed, which was likely to result in Armageddon.⁶⁶

Concern about fallout from atmospheric H-bomb tests proved to be an anti-nuclear catalyst for segments of the British populace, spawning the Campaign for Nuclear Disarmament. Strong anti-nuclear sentiment also gathered momentum in the Labor Party in the late-1950s, largely in opposition to the adoption of massive retaliation. The left-wing of the party was increasingly advocating that Britain should unilaterally relinquish her nuclear weapons capability. Pressure from this segment of the party significantly constrained Labor's more mainstream leadership vis-à-vis the nuclear deterrent, leading, for example, to the decision of the Wilson Government to cancel the fifth Polaris submarine. Wilson was, however, able to isolate the unilateralists within Labor's ranks and effectively preserve Britain's nuclear deterrent.⁶⁷

A theme of the late-1950s that was resurrected in the 1980s was that Britain, because of its sense of responsibility to provide international leadership, should set an example for other nations with respect to nuclear weapons. For unilateralists, this meant renunciation as a means of establishing a “non-nuclear club.” For mainstream political leaders, this meant that Britain should take the lead in promoting nuclear arms control. Thus, Harold Macmillan diligently pushed for and ultimately achieved the 1963 PTBT. While Britain only pushed for the agreement after its own H-bomb had been tested, the moral convictions of Macmillan appear genuine.⁶⁸ Moreover, the test ban success reinforced the notion that Britain could best facilitate nuclear arms control by her membership in the nuclear club. Another, less kind, interpretation is that as Britain's military power declined in the post-war era, it was offset by her sense of moral superiority.⁶⁹

Still, there is ample reason to believe that the British Government has never been completely comfortable with the prospect of having to use nuclear weapons, even in retaliation. As noted in the 1955 Statement on Defense:

The consciences of civilized nations must naturally recoil from the prospect of using nuclear weapons. Nevertheless, in the last resort, most of us feel that determination to face the threat of physical devastation, even on the immense scale which now must be foreseen, is manifestly preferable to an attitude of subservience to militant Communism...⁷⁰

⁶⁵ Gowing, *op. cit.*, pp. 324-326, 370-372.

⁶⁶ Arnold, *op. cit.*, p. 55.

⁶⁷ Pierre, *op. cit.*, pp. 290-291.

⁶⁸ Baylis, *op. cit.*, pp. 338-340.

⁶⁹ Pierre, *op. cit.*, p. 81. See also, Heuser, *Nuclear Mentalities*, pp. 49-50.

⁷⁰ Statement on Defense 1955, *Cmd 9391*, February 1955, excerpted in Poole, *op. cit.*, p. 157.

While the “better dead than Red” sentiment was not evident in the 1981 Statement on the Defense Estimates, the repugnance of nuclear use was reiterated:

Any readiness by one nation to use nuclear weapons against another, is terrible. No one – especially from within the ethical traditions of the free world, with their respect for individual life – can acquiesce comfortably in it as the basis of international peace for the rest of time. We have to seek unremittingly, through arms control and otherwise, for better ways of ordering the world...⁷¹

In deference to the pragmatic theme that runs throughout British nuclear strategy, the 1981 Statement goes on to warn:

No safer system than deterrence is yet in view, and impatience would be a catastrophic guide in the search. To tear down the present structure, imperfect but effective, before a better one is firmly in our grasp would be an immensely dangerous and irresponsible act.

Thus, Britain’s adoption of nuclear deterrence appears to have been made reluctantly since it could not easily be reconciled with Western and Christian moral and ethical standards. On balance deterrence was considered preferable to other paradigms, such as conventional-only defense which was clearly beyond Britain’s, and indeed the West’s, resources and was not likely to work in the face of a nuclear-armed adversary.

II. The Evolution of British Nuclear Strategy, Doctrine, and Force Posture

A. Deterrence

The theory of nuclear deterrence can trace its roots to Britain, predating the world’s first nuclear weapons test by five years. In 1940, Otto Frisch and Rudolf Peierls, two refugee scientists working at the University of Birmingham in Britain produced perhaps the first theoretical explanation of how an atomic bomb could be constructed. Notably, these scientists also concluded that:

If one works on the assumption that Germany is, or will be, in the possession of this weapon, it must be realized that no shelters are available that would be effective and could be used on a large scale. The most effective reply would be a counter-threat with a similar bomb. Therefore, it seems to us important to start production as soon and as rapidly as possible, even if it is not intended to use the bomb as a means of attack.⁷²

Contained in this assessment are the themes that have consistently dominated Britain’s approach to nuclear strategy. Namely, that there is no effective defense against nuclear weapons; that the only form of defense is to deter nuclear attack by the threat of retaliation in kind; and that nuclear weapons are essentially political rather than “warfighting” instruments.

⁷¹ Statement on the Defense Estimates 1981, *Cmnd 8212-I, 1981*, excerpted in Poole, *op. cit.*, p. 143. Sir Michael Quinlan was the author of this excerpt.

⁷² Poole, *op. cit.*, p. 15.

To be sure, Britain was no stranger to the overall concept of deterrence. Since the First World War, Britain had been grappling with the threat of aerial bombardment against its cities. Three approaches had been considered by British leaders in the inter-war period: a build-up of air defenses, including fighter aircraft, to physically counter such attacks; an international treaty to ban aerial bombardment of cities; and a strategy of deterrence underwritten by threat of retaliatory attacks against the adversary's cities. As hopes for an international agreement faded, Britain paid lip service to deterrence but put its emphasis on defenses.⁷³ Once war broke out and the Battle of Britain got underway, the investment in defenses proved critical since deterrence of city bombing had failed.

Britain found itself with similar options at the end of the war. Prospects for international control of atomic weapons dimmed as the Cold War set in. The atom bomb had now effectively nullified the defense option, however, since even a small number of bombers getting through could devastate Britain. In the view of many British political and military leaders, the revolutionary destructiveness of the atomic bomb could make deterrence durable in a way that the threat of conventional aerial bombardment could not. Although the threat of atomic attack against civilian populations posed fundamental moral questions, British planners were quick to adopt nuclear deterrence as the basis for post-war defense strategy.

The notion of nuclear deterrence began to be reflected in British military thinking shortly before the first atomic bombings. A committee of prominent scientists convened by the Ministry of Defense reported on July 3, 1945 that, "the only answer that we can see to the atomic bomb is to be prepared to use it ourselves in retaliation. A knowledge that we were prepared, in the last resort, to do this might well deter an aggressive nation."⁷⁴ A British Admiralty report in September 1945 concluded:

The net effect of the Atomic Bomb is that the price worth paying for peace is now very much higher, and that the main function of our armed forces should be the prevention of major war, rather than the ability to fight it purely on military grounds...⁷⁵

Thus, the Admiralty's thinking was slightly ahead of American strategist Bernard Brodie, who wrote in 1946 that, "Thus far the chief purpose of a military establishment has been to win wars. From now on its chief purpose must be to avert them."⁷⁶ The British Chiefs of Staff weighed in with their views in October 1945: "the best method of defense against the [atomic] weapon is likely to be the deterrent effect that the possession of the means of retaliation would have on a potential aggressor."⁷⁷

From this early appreciation of nuclear deterrence, British strategists had to contend with how to translate theory into practice. There were essentially two schools in this regard. Winston Churchill seems to have been the leading proponent of existential deterrence. That is, as long as Britain had the proven ability to produce nuclear weapons, the size of the stockpile and the

⁷³ Clark and Wheeler, *op. cit.*, p. 21.

⁷⁴ Baylis, *op. cit.*, pp. 45-46. The Jefferies Committee of the Manhattan Project reached a similar conclusion in a September 1944 report. Patterson, *op. cit.*, p. 17.

⁷⁵ Baylis, *op. cit.*, pp. 46-47.

⁷⁶ Paterson, *op. cit.*, p. 18.

⁷⁷ Clark and Wheeler, *op. cit.*, p. 75.

ability to deliver it against the Soviet Union were of lesser concern.⁷⁸ The Chiefs of Staff disagreed with this view and believed that the “article” was just as important as the “art” of deterrence.⁷⁹ Lord Cherwell also believed that Britain needed a demonstrable nuclear capability, although he was motivated more by the need to influence U.S. policy than to deter an adversary:

If we are unable to make bombs ourselves and have to rely entirely on the US army for this vital weapon, we shall sink to the rank of a second class nation, only permitted to supply auxiliary troops like the native levies who were allowed small arms but not artillery.⁸⁰

As evidenced by the key milestones in Table 1, it appears that the existential deterrence school held considerable sway in Britain with, for example, an operational thermonuclear capability not being completed until the early 1960s:

Table 1: Key Milestones in Britain’s Nuclear Force Posture

Milestone	Date	Comment
First atomic bomb test	1952	5 years after the Government’s “go” decision and despite direct participation in the Manhattan Project.
First operational bomber capable of reaching the Soviet heartland with an atomic bomb	1955	8 years after the military officially identified the Soviet Union as the greatest threat to Britain. ⁸¹
First fully successful H-bomb test	1957	3 years after the Government’s “go” decision, but with significant prior research.
First generation of V-bombers completed and armed with H-bombs	1961	4 years after Britain officially places deterrence via massive nuclear retaliation at the heart of its defense strategy. ⁸²
Full operational capability of modified Polaris warheads to ensure penetrability of the Moscow ABM system	1987	14 years after official project authorization; 21 years after the first public revelation that the USSR was building a ballistic missile defense around Moscow ⁸³

Implicit in these milestones are such restraining influences as the cessation of U.S. nuclear weapons cooperation with Britain from 1946 to 1958, the dire economic straits Britain confronted after the war, and a threat assessment that put the risk of Soviet attack highest after 1957. Nonetheless, the pace of nuclear force development, particularly completion of a strategic delivery capability, indicates that British declaratory policy tended to outreach the ability to execute.

⁷⁸ Simpson, *op. cit.*, p. 76.

⁷⁹ Clark and Wheeler, *op. cit.*, p. 166.

⁸⁰ Baylis, *op. cit.*, p. 128.

⁸¹ The first Valiant squadron became operational that year. It took Britain 13 years to go from issuance of V-bomber specifications to full equipment of RAF squadrons with the basic models. Malone contends that the Canberra jet bombers based in Germany could credibly threaten some targets in the Soviet Union and were explicitly earmarked for strategic missions, putting the date at 1954. *Op. cit.*, p. 9.

⁸² By convention, the Sandys White Paper of 1957 is acknowledged as the official adoption of massive retaliation, although prior white papers and the 1952 Global Strategy Paper incrementally paved the way.

⁸³ Malone notes that missile flight trial errors in 1980, “were likely to result in delaying Chevaline’s full operational capability until the end of 1987.” *Op. cit.*, p. 21. Presumably this means all four Polaris subs might not be fully Chevaline-equipped until then, but according to the Aldermaston Weapons Establishment, the initial operational capability for the system was 1982. See http://www.awe.co.uk/main_site/about_awe/keeping_the_peace/1973.htm

B. Massive Retaliation

British nuclear strategists quickly seized upon the notion that in order to deter another devastating war in Europe it was necessary to threaten the Soviet heartland with even greater atomic destruction. As articulated in the 1952 Global Strategy Paper:

Since no effective defense against atomic attack is in sight, the primary deterrent must be the knowledge on the part of the Kremlin that any aggression on their part will involve immediate and crushing retaliation by the long-range Air Striking Force with the atomic weapon. The value of this deterrent will not be appreciably lessened as Russia builds up her own stock of atom bombs, provided – and only provided – that the intention of the Allies to use the atom bomb immediately is unmistakably clear to the Russians.⁸⁴

Thus, integral to the strategy of massive retaliation as initially defined by the British was not only the possession of atomic bombs but a convincing willingness to use them. Also clear was the “trip wire” nature of the strategy. As Attlee had commented as early as 1945, “twice is he armed who gets in the first blow.”⁸⁵ The 1952 Global Strategy Paper was briefed to the senior U.S. military and political leadership and is generally believed to have influenced the Eisenhower Administration’s adoption of a similar posture referred to as the “New Look.”⁸⁶

C. Mutual Vulnerability and Extended Deterrence

Because of Britain’s acute sense of vulnerability to Soviet nuclear attack, British strategists also were quick to assess the implications of a Soviet nuclear threat against the U.S. heartland. In 1954, two views were expressed within British military circles. The Joint Planning Staff contended that the prospects of mutual annihilation would enhance deterrence. In contrast, the Air Defense Subcommittee argued that nuclear stalemate or “equipoise” between the United States and Russia would call into question the American nuclear guarantee to defend Europe. The Committee argued that once, “New York is vulnerable to retaliation, the USA will not use her strategic weapon in defense of London.”⁸⁷

The issue of extended deterrence in an age of mutual vulnerability posed very delicate diplomatic issues for Britain. On the one hand, the U.S. commitment to defend NATO was absolutely essential to British strategy. Accordingly, London went to great lengths to keep the United States engaged in Europe, not least by helping Washington to shoulder the Western defense burden. On the other hand, fear of U.S. isolationism has deep roots in Britain. It was only prudent that British military planners hedge against the possibility that NATO might one day collapse or that in a time of extreme peril, the United States might withhold its nuclear forces from the defense of Western Europe.

British leaders have been caught between these imperatives since the 1950s. Churchill did not question the American nuclear guarantee but rather argued that Britain needed an

⁸⁴ Macmillan and Baylis, *op. cit.*, pp. 31-32.

⁸⁵ Baylis, *op. cit.*, p. 94.

⁸⁶ Clark and Wheeler, *op. cit.*, pp. 178-182.

⁸⁷ Baylis, *op. cit.*, pp. 185-188.

independent nuclear force to ensure that Soviet targets that were of highest priority to Britain would be attacked in a timely fashion. Other expressions were more nuanced, calling attention to the possibility that the *Soviets* might misjudge the U.S. commitment to defend Europe, as in the 1964 Defense White Paper:

[I]f there were no power in Europe capable of inflicting unacceptable damage on a potential enemy [the Soviets] might be tempted – if not now then perhaps at some time in the future – to attack in the mistaken belief that the United States would not act unless America herself were attacked. The V-bombers by themselves are, and the Polaris submarines will be, capable of inflicting greater damage than any potential aggressor would consider acceptable.⁸⁸

This later evolved into the so-called “second center” rationale, whereby Britain’s contribution of nuclear forces to NATO complicated Soviet military planning and provided a hedge against any weakening of the U.S. nuclear guarantee. The hedge sentiment was also reflected in the 1980s with, for example, Defense Secretary John Nott justifying Britain’s acquisition of the Trident system thusly:

I’m not buying [the Trident D-5] for NATO. In the last resort we must be able to stand alone. I’m greatly in favor of the Alliance, but you can never tell, and I can’t be sure that the Alliance will be as healthy in 20 years’ time as it is today.⁸⁹

In contrast to these public statements, internal government communications at times seemed to rule out any notion of independent British use of nuclear weapons. For example, Prime Minister Macmillan and his Cabinet Defense Committee in 1957 expressed the view that Britain should never expect to challenge the Soviet Union alone. Rather, Britain would use its nuclear weapons against Russia only in conjunction with the United States – “deterrence in concert.”

British nuclear planners tasked with reconciling these divergent attitudes have developed, in effect, a split personality for Britain’s nuclear forces. That is, two separate targeting and command and control schemes have been maintained for decades, one which is coordinated through NATO and the other a British-only arrangement in the event, however unlikely, that Britain needed to resort to nuclear use independent of NATO and the United States.

For a short period of time, Britain herself considered extending a nuclear security guarantee overseas. China’s nuclear test in 1964 raised concerns in London about the vulnerability of India, a key former British colony. Prime Minister Harold Wilson discussed the possibility of a British nuclear guarantee with his Indian counterpart in December 1964. In the end, however, no such guarantee was extended, not least because of the analogous credibility issues that plagued the U.S. guarantee to Europe.⁹⁰

⁸⁸ Freedman, Navias, and Wheeler, *op. cit.*, p. 7.

⁸⁹ *Ibid.*, pp. 8-9.

⁹⁰ Pierre, *op. cit.*, pp. 285-287.

D. Graduated Deterrence and Sub-Strategic Warning

As the first to advocate massive retaliation as a national strategy, the British were also the first to appreciate its shortcomings. To be sure, massive retaliation was not universally embraced within the armed forces or the government. Such dissenters typically believed that too much faith had been placed in the “great deterrent,” to the neglect of the economy and the conventional forces. From these ranks came consideration of so-called “graduated deterrence.” The leading advocate of this concept, retired Rear Admiral Sir Anthony Buzzard, contended that massive retaliation was fundamentally flawed because it threatened, “to destroy civilization as a result of any aggression too powerful for the West’s small conventional forces to deal with.”⁹¹ Consequently, in instances short of general war, the great deterrent would be exposed as the “great bluff.” A devout Christian, Buzzard believed that the West should not cause any greater destruction than was absolutely necessary to induce the warring parties to return to the negotiating table. Buzzard sought to demarcate some boundaries on nuclear use, referring to “tactical use” as the application of atomic weapons against targets other than towns and cities. “Strategic use” would include H-bombs and any nuclear use against civilian centers.

British military planners did undertake an assessment of graduated deterrence and found it unsatisfactory, at least in the context of war in a divided Europe. Planners believed that no practical distinction could be made between strategic and tactical nuclear use in the heat of battle. Moreover, there was a strong disposition against diluting the impact of massive retaliation, upon which the deterrence of major war in Europe rested.⁹² For this reason, the British military objected to the American doctrine of flexible response which emerged in the early-1960s. Whereas the United States sought to increase NATO’s conventional defenses to reduce the prospect for nuclear escalation and thereby possibly confine a war to Europe, British officials maintained that deterrence would not be sufficiently enhanced by conventional force improvements as to warrant the severe economic impacts of such a posture. Britain’s resistance over this issue led to a drawn out debate within NATO, such that flexible response was not formally adopted until 1967. Even then, compromise language was required that left some uncertainty as to when NATO might escalate to nuclear use.

British strategists treated tactical nuclear weapons with equal suspicion. While the value of tactical nuclear weapons had been acknowledged by the Chiefs of Staff as early as 1952, primarily to offset reductions in conventional forces, British military planners rejected the notion that nuclear war could or should be kept limited to the tactical level. As noted in a 1963 Joint Planning Staff paper:

...the provision of tactical nuclear weapons should be for deterrence and not for fighting a battle...In this sense we regard the provision of tactical nuclear weapons as the link between initial conventional resistance and the actions required to impose withdrawal or to escalate to global war...The use of a very small number of low yield nuclear weapons would convey a powerful warning of Allied determination. We consider that targets in the immediate area of operations should be selected. Although there might be little immediate effect on the current land/air operations, the psychological impact would be out of all proportion to the actual damage

⁹¹ Baylis, *op. cit.*, pp. 196-202.

⁹² *Ibid.*, p. 202.

and might cause the Soviets to halt their aggression. Alternatively, it might cause them to proceed at once to a pre-emptive strategic strike.⁹³

Thus, British planners thought it prudent to plan for the discriminate use of a small number of nuclear weapons as a final warning to the Soviet Union that unless it ceased its aggression, escalation to strategic nuclear use was imminent. As the Joint Planners made clear, however, this was a very risky proposition that might actually precipitate Soviet escalation to strategic nuclear use. Perhaps for this reason, the so-called “sub-strategic” nuclear option, was not overly emphasized in British thinking. It did, however, find expression as late as 1993, in the comments of Defense Minister Malcolm Rifkind:

It is...important for the credibility of our deterrent that the United Kingdom also possesses the capability to undertake a more limited nuclear strike in order to induce a political decision to halt aggression by delivering an unmistakable message of our willingness to defend our interest to the utmost.⁹⁴

In this context, the transition from the Cold War bi-polar competition to a more uncertain security environment, one that features the proliferation of weapons of mass destruction, may well have encouraged British military planners to keep their options open.

E. Post-Cold War Developments

Public articulation of, and debate over, nuclear strategy in Britain essentially peaked in 1964-1965. A “period of silence” then settled in until the late-1970s, when the neutron bomb and INF issues arose. In part, this absence of discussion reflected a theoretical stalemate between independent deterrence and deterrence in concert. Also, the impetus for strategic thought had clearly shifted to the United States, as evidenced by the very limited number of studies that were produced by the British strategic community during this period versus its American counterpart.⁹⁵ Thus, from the British perspective, the NATO doctrine of flexible response prevailed until the early 1990s. With the end of the Cold War, however, significant change took place in British nuclear strategy and, more importantly, force posture.

Acknowledging the fundamental political transformations that accompanied the collapse of the Soviet Union, the United Kingdom undertook a far-reaching reassessment in 1998. The Strategic Defense Review upheld the continuing importance of nuclear deterrence but cast it in a much broader light: “...nuclear deterrence still has an important contribution to make in insuring against the re-emergence of major strategic military threats, in preventing nuclear coercion, and in preserving peace and stability in Europe. The review also called attention to the threat of proliferation.⁹⁶

⁹³ Baylis, *op. cit.*, pp. 333-334.

⁹⁴ Data obtained from the web page of the Scottish Campaign for Nuclear Disarmament (CND): <http://ds.dial.pipex.com/cndscot/wmd/ch5tother.htm>. July 12, 2001.

⁹⁵ Freedman, Navias, and Wheeler, *op. cit.*, pp. 7-8.

⁹⁶ *Ibid.*

In light of the new political environment, the Strategic Defense Review announced substantial changes in Britain's nuclear force posture:⁹⁷

- Britain will maintain fewer than 200 operationally available nuclear warheads (a reduction of one third from the previous government's plans);
- Trident submarines on deterrent patrol will carry 48 warheads (this compares with the previous government's ceiling of 96 warheads on each submarine and is the same number as carried on the Polaris submarines when they entered service in the late-1960s); and,
- Britain has no operational need for any more than the 58 Trident missile bodies already delivered or on order.

The Strategic Defense Review also acknowledged that the end of the Cold War made possible the outright elimination of the following British nuclear capabilities:

- the nuclear Lance missile and artillery roles we undertook previously with US nuclear weapons held under dual-key arrangements;
- our maritime tactical nuclear capabilities, so that Royal Navy surface ships no longer have any capability to carry or deploy nuclear weapons; and,
- all of air-launched nuclear weapons.⁹⁸

Consistent with these changes, the readiness levels of Britain's sole remaining nuclear platform, the Trident submarine, were reduced (see appendix below).

III. Target Selection

Britain's approach to nuclear targeting is best described as evolutionary. The types and number of targets selected has varied over the decades. From an initial presumption that cities were the main targets of atomic attack to consideration of blunting a Soviet nuclear strike to holding at risk the sources of Soviet "state power," British target lists were periodically adjusted in search of what was most likely to deter and under what circumstances.

Initially, British planners concluded that cities were the natural targets of atomic attack. In January 1946, the Joint Technical Warfare Committee concluded that since the number of nuclear weapons was expected to be limited, "only important targets would be worth a bomb." Large towns would be the most common such targets, since, "the bombing of towns and industry now gives a far greater return for war effort expended and may therefore become the most profitable type of war."⁹⁹ Other factors that likely contributed to the early presumption of city targeting were the atomic bombings of Hiroshima and Nagasaki, as well as the proclivities of the RAF, fresh from its wartime experience of bombing German cities and industry.

No sooner had the military articulated this counter-city policy than attention focused on how best to blunt a Soviet attack. Thus, also in 1946, the British military was actively

⁹⁷ U.K. Ministry of Defense. "Deterrence, Arms Control and Proliferation," July 1998. Internet: <http://www.nyu.edu/globalbeat/nuclear/ukdefence0798.html>.

⁹⁸ *Ibid.*

⁹⁹ Clark and Wheeler, *op. cit.*, p. 73.

considering targeting the oil fields in the Caucasus, which were deemed essential to the Soviet war machine. Indeed, the RAF successfully argued on behalf of retaining bomber bases in the Middle East in order to reach these strategic targets.¹⁰⁰ Lingering concerns about Britain's vulnerability to nuclear attack soon got the Chiefs thinking about limiting the damage of a Soviet strike in a more direct fashion. A 1951 Air Ministry study concluded that a force of 200 bombers armed with atomic bombs could reduce the weight of a Soviet nuclear attack against Britain by 50 percent.¹⁰¹ Increasingly, the military realized that the *sooner* they launched their nuclear attack against Russian bomber bases, the better the outcome for Britain. Thus, by 1953, the Chiefs were to report that:

...should the deterrent fail, it is vital to reduce the threat by countering at source Russia's capacity for long-range attacks...planning is now proceeding for *immediate* counter-bombardment of the enemy's long-range bomber bases on the outbreak of war.¹⁰²

The emphasis on counter-force targeting was an important consideration in determining the size of the V-bomber force. While a rigorous strategic calculation was lacking, the RAF asserted that 240 V-bombers were needed to blunt a Soviet nuclear attack. A committee under the direction of Lord Swinton in 1954 confirmed this as the appropriate force level and added:

The Soviet long range Air Force to-day occupies forty permanent bases, but we know of at least 150 other airfields in European Russia and the Satellites from which these aircraft...can operate in war. The bases will doubtless figure amongst the targets to be attacked by the American Strategic Air Force. But we cannot be sure what priority the Americans will accord them...Since the very survival of Britain would depend upon the promptness and thoroughness of the counter-attack against these Russian air bases, it is essential that we should ourselves possess and control a bomber force capable of performing this task.¹⁰³

As coordination between the RAF and SAC gained momentum in the late-1950s, it became possible to de-conflict each side's nuclear targeting. A June 1958 Chiefs of Staff report confirmed that under the joint plan, RAF Bomber Command was assigned to:

- (a) 69 cities which are centers of government or of other military significance
- (b) 17 long-range air force airfields which constitute part of the nuclear threat
- (c) 20 elements of the Soviet air defense system¹⁰⁴

Some observations about this plan are in order. To begin, the overall number of targets assigned to Bomber Command was a function of the number operational aircraft and nuclear weapons available to it. The plan also suggests that the distinction between counter-force and counter-

¹⁰⁰ Clark and Wheeler, *op. cit.*, pp. 96-97.

¹⁰¹ *Ibid.*, p. 99.

¹⁰² *Ibid.*, p. 101. Emphasis added. Britain's *Galloper* war plan for 1950-1951 had already assumed such a posture, with the presumption that the United States would provide Britain with a stock of nuclear bombs. Baylis contends that British counterforce targeting was more an aspiration than a reality in the late-1940s, often advocated to support internal bureaucratic struggles over missions and resources. Still, he acknowledges that counterforce began to overtake population and economic targets in British thinking in 1950. *Op. cit.*, pp. 88-92.

¹⁰³ Baylis, *op. cit.*, p. 173.

¹⁰⁴ *Ibid.*, Appendix 11, p. 431.

value targeting could easily be blurred. Lastly, the inclusion of Soviet air defense targets makes clear that the V-bombers, which were five hours closer to the Soviet Union than their American counterparts, were partly intended to clear a path for SAC to deliver the main blow against the Soviet Union.

With the growth of the Soviet theater nuclear force in the late-1950s, British enthusiasm for a counter-force strategy began to wane. Instead, more emphasis was placed on determining the broader level of destruction necessary to deter the Soviet Union from attacking Britain. Such emphasis also was consistent with the British need to develop independent targeting options in the event U.S. nuclear forces were not made available. In such circumstances, the Chiefs of Staff concluded in 1957 that the most effective use of Britain's limited nuclear forces would be against Soviet "centers of administration and population."¹⁰⁵

How many Soviet urban targets were to be held at risk was open to interpretation. In late 1959, the British Nuclear Deterrent Study Group recommended a targeting plan covering 40 major cities in Russia, including Moscow and Leningrad. Two years later, Defense Secretary Harold Watkinson criticized this figure as being arbitrarily set. He proposed that the figure of 10 Soviet cities be used instead. Watkinson offered no formula by which he derived that number, although he noted that it held implications for the number of air-to-surface missiles and nuclear warheads that would have to be procured. In 1962, the Cabinet came up with a compromise figure of 15 cities. Again, the methodology that gave rise to that specific number is obscure. It has been suggested that the move from 40 to 15 cities was influenced, in part, by pressure from the United States to conform to its own preference for minimizing the targeting of cities. Hence, in contrast to the 1958 joint plan, the 1962 iteration assigned Bomber Command only 16 cities, 44 bomber bases, 10 air defense control centers, and 28 intermediate-range ballistic missile sites.¹⁰⁶

British planners quickly began to focus attention on how to refine the counter-city concept, not least due to obvious moral reservations. Thus, while the Joint Planning Staff advocated in 1949 the targeting of Russian cities it was not for the sake of creating massive civilian casualties but rather as a means of disrupting Soviet control over its rear areas and thus the ability to carry on the fight:

...the complete removal of the Soviet regime will be an essential requirement for achieving allied war aims. We consider that effective air attacks upon the towns, which are the centers of control – political and administrative – is the best method of creating conditions in which the Communist Party and the administrators could not control and the secret police could not suppress. When control is disrupted the armed forces will not be able to fight effectively.¹⁰⁷

This notion of targeting was publicized in the 1958 Defense White Paper: "...the strategy of NATO is based on the frank recognition that a full-scale Soviet attack could not be repelled without resort to a massive nuclear bombardment of the *sources of power* in Russia."¹⁰⁸

¹⁰⁵ Baylis, *op. cit.*, p. 308.

¹⁰⁶ *Ibid.*, pp. 304-305.

¹⁰⁷ *Ibid.*, p. 91.

¹⁰⁸ Heuser, *NATO*, p. 75. Emphasis added.

As evidenced by the enormous investment made in the Chevaline program, the ability to threaten Moscow has been essential to British nuclear targeting policy. The importance of targeting Moscow was explained by Sir Herman Bondi, Chief Science Advisor to the Ministry of Defense in the 1970s:

As far as the other side is concerned, one is talking of a highly centralized system. [T]he enormous importance of Moscow in the Soviet Union is quite clear. So abandoning the “Moscow criterion” would be a very severe reduction in what one might call the “quality of the deterrent” and its prime task of helping to keep the peace.¹⁰⁹

In short, the Communist control apparatus which emanated from Moscow was determined to be the most crucial source of Soviet state power and a critical nuclear targeting option for Britain. The limitations of normal Polaris submarine patrol schedules plus the Moscow ballistic missile defenses meant in practice, however, that a decision to target Moscow could severely limit Britain’s ability to target any other part of the Soviet Union (see below).

As part of its justification for replacing Polaris with the much more capable Trident system, the British Government offered in 1980 its most detailed account of the criteria by which it selected nuclear targets:

10. There is no way of calculating exactly how much destruction in prospect would suffice to deter [the Soviet Union]. Clearly Britain need not have as much power as the United States. Overwhelming Britain would be a much smaller prize to an aggressor than overwhelming the United States, and a smaller prospective penalty could therefore suffice to tilt his assessment against starting aggression that would risk incurring the penalty. Indeed, one practical approach to judging how much deterrent power Britain needs is to consider what type and scale of damage Soviet leaders might think likely to leave them critically handicapped afterwards in continuing the confrontation with a relatively unscathed United States.
11. The Soviet Union is a very large and powerful state, which has in the past demonstrated great national resilience and resolve. Its history, outlook, political doctrines and planning all suggest that its view of how much destruction would constitute intolerable disaster might differ widely from that of most NATO countries. Appalling though any nuclear strike would be, the Government does not believe that our deterrent aim would be adequately met by a capability which offered only a low likelihood of striking home to key targets; or which posed the prospect of only a very small number of strikes; or which Soviet leaders could expect to ward off successfully from large areas of key importance to them. They might even be tempted to judge that if an opponent equipped himself with a force which had only a modest chance of inflicting intolerable damage there might be only a modest chance that he would have the resolve to use it all.
12. Successive United Kingdom Governments have always declined to make public their nuclear targeting policy and plans, or to define precisely what minimum level of destructive capability they judged necessary for deterrence. The Government however thinks it right now to make clear that their concept of deterrence is concerned essentially with posing a potential threat to key aspects of Soviet state power. There might with changing conditions be more than one way of doing this, and some flexibility in contingency planning is appropriate. It would not be helpful to deterrence to

¹⁰⁹ Freedman, Navias, and Wheeler, *op cit.*, pp. 15-16.

define particular options further. The Government however regards the considerations noted in paragraphs 10 and 11 above as important factors in deciding the scale of capability we need.¹¹⁰

Very carefully crafted, this statement of British targeting policy is notable for its blend of candor and discretion. It acknowledges that there is no precise calculation of what will deter, yet it demonstrates sensitivity towards the unique historical and cultural experience of the Soviet Union as a benchmark for estimating unacceptable levels of damage. This approach is supplemented by considerations of realpolitik, or the correlation of forces, which is also designed to appeal to the Soviet way of thinking. Yet, the statement preserves ambiguity in order to maximize Soviet uncertainty and, it is hoped, restraint.

Try as they might to make nuclear retaliation more discriminate and thus more palatable morally, British leaders appear not to have been misled into thinking that such an approach would not still produce millions of Russian fatalities. It is also reasonable to assume, as in the U.S. experience, that while British policymakers held certain assumptions or preferences about nuclear targeting, the actual plans developed by the military could differ significantly from those expectations. There is reason to believe that such a gap existed in British nuclear targeting plans into the early 1990s, stimulating at least one high-level effort to try to make them more discriminate.¹¹¹ In 1994, the United Kingdom announced that it was no longer targeting its nuclear weapons against Russia.¹¹²

IV. Communication of the Deterrent by the British

As noted above, British strategists were quick to appreciate that for nuclear deterrence to be effective, the adversary had to be made aware of one's retaliatory capability and the will to use it. This communication largely took the form of official statements and observance of the nuclear force itself. As for the former, the annual Statements on Defense have been the main vehicles by which the British government publicly conveyed its intent. For example, the 1955 Statement signaled Britain's shift toward massive retaliation and acknowledged the importance of notifying the Kremlin thereof:

This [Allied] deterrent must rest primarily on the strategic air power of the West, armed with nuclear weapons. The knowledge that aggression will be met by overwhelming nuclear retaliation is the surest guarantee that it will not take place.¹¹³

As documented throughout this chapter, British prime ministers and other government officials have been another major source of authoritative statements on British nuclear strategy, particularly within the context of Parliamentary debates. Britain has also taken full advantage of NATO forums to publicly advance its nuclear views, as reflected in the controversy over flexible response. Notably, the civilian leadership has tightly controlled the British military, with the

¹¹⁰ Excerpt: *Defense Open Government Document 80/23*, July 1980, "The Future United Kingdom Strategic Nuclear Force." The author is grateful to Sir Michael Quinlan, chief author of the report, for making this excerpt available.

¹¹¹ Author interview, London, November 2002.

¹¹² Speech by the Secretary of State for Defense, the Right Hon George Robertson MP, "Nuclear Disarmament in the Modern World," March 1, 1999. Internet: <http://www.fas.org/sgp/news/mod030199.html>.

¹¹³ Statement on Defense 1955, *Cmnd 9391*, February 1955, excerpted in Poole, *op. cit.*, p. 155.

latter making few public comments on nuclear strategy. Once retired from government service, but still within the constraints of the Official Secrets Act, some military officers, as well as former government scientists, have gone public with their views, as in the case of Sir Anthony Buzzard and his critique of massive retaliation.

In their public statements, British leaders tend to emphasize what Harold Macmillan once described as the “absolute certainty” of nuclear retaliation, the better to bolster deterrence. They have been far more reluctant, however, to identify specific thresholds or “red lines” that if exceeded would unleash that retaliation. A rare exception in this regard is the February 26, 1958 statement by Prime Minister Macmillan in the House of Commons in which he defined three specific red lines that would merit unleashing Britain’s strategic nuclear forces: the large-scale mobilization of Soviet ground forces (e.g., 200 divisions), an all-out attack on Europe, or the conventional bombing of London.¹¹⁴ The Cabinet’s discomfort with Macmillan’s comments, likely made extemporaneously, is evident in the remarks of Defense Minister Sir Walter Monckton, just two days later:

...I do not think, I may say frankly, that it would be a practicable policy for any Government to define precisely in advance the circumstances in which it would use some weapons and not others. Any attempt to make a definition of that kind in advance could hardly be to our advantage. Indeed, it might make others, who may be pondering on the question of whether they could take risks, to see how far they might go without bringing down upon them the ultimate deterrent. I think an attempt to define in advance and to lay down hypothetical cases is doomed to failure.¹¹⁵

Successive British governments have adhered steadfastly to this policy ever since.

The second major means by which Britain communicated its deterrent threat was to maintain, and to be seen maintaining, a credible nuclear force. As indicated above, this has been a major challenge for Britain, a smaller power with limited resources. Consequently, the force demonstration method of communication has been unevenly applied. Certain capability thresholds have been publicly touted by Britain, such as the 1954 announcement that the Canberra jet bombers based in West Germany were nuclear-capable. Other thresholds have been similarly announced yet not fully warranted. For example, the British government did nothing to correct public impressions that its initial H-bomb tests were successful, even though it knew that they had failed to achieve megaton yields.¹¹⁶

In later years, a “deterrence gap” was opened during which the ability of the V-bombers to penetrate Soviet air defenses was increasingly put in doubt. To reinforce deterrence, the Government publicly announced that special measures were being undertaken to keep the bombers viable. Nonetheless, this gap endured from 1965-1969 until the third Polaris submarine became operational and the Royal Navy relieved the Royal Air Force of its strategic deterrence mission. Even then, the Polaris force was not above question.

¹¹⁴ Pierre, *op. cit.*, p. 166.

¹¹⁵ House of Commons Debate, 28 February 1958; speech by Sir Walter Monckton (Minister of Defense), *Hansard* col. 1035, excerpted in Poole, *op. cit.*, pp. 172-173.

¹¹⁶ Baylis, *op. cit.*, pp. 260-264.

The first Polaris submarine, for example, reportedly made its maiden operational patrol in 1968 with less than a full complement of warheads due to a production bottleneck.¹¹⁷ Because the Labor Government of Harold Wilson canceled a fifth Polaris submarine, for roughly half of each year, there was only one Polaris submarine on patrol. During such a period, at most Britain could hold at risk 16 Russian cities outside of the Moscow missile defense footprint or only Moscow itself, since it was estimated that an entire Polaris submarine's missile load would be needed to penetrate Moscow's missile defenses.¹¹⁸

Moreover, the Government did not publicly divulge until 1980 that it had been redesigning the front-end of the Polaris re-entry vehicle to improve its ability to penetrate Moscow's missile defenses, some seven years after the Chevaline program had commenced. Reportedly, it would take another 7 years until the entire Polaris fleet was equipped with the Chevaline re-entry vehicles.¹¹⁹ All of this suggests that Britain could be highly selective in what it divulged publicly about its nuclear forces, making them seem more formidable (i.e., credible) at times than perhaps was justified.

V. Britain's Perspectives on Stability of Deterrence at Low Levels of Nuclear Weapons

Over the years, British military planners and strategists have paid close attention to stability issues as they pertain to nuclear weapons. While atomic weapons were dreaded because of Britain's sense of acute vulnerability, they were also looked upon as a means of keeping the peace under what was hoped would be a joint U.K.-U.S. policing of the globe. Not far from British thinking throughout the mid-1940s, however, was the prospect that Russia would get her own atomic bombs and that an East-West atomic arms race would ensue.

After the Soviet nuclear test in 1949, British strategists began to assign less importance to the numbers of weapons that the Russians might acquire. The following year, the Chiefs of Staff maintained that the USSR would not venture to attack NATO because its nuclear stockpile was small and it could not reach the continental United States.¹²⁰ The 1952 Global Strategy Paper, further noted that:

The value of [the West's nuclear] deterrent will not be appreciably lessened as Russia builds up her own stock of atomic bombs, provided – and only provided – that the intention of the Allies to use the atom bomb immediately is unmistakably clear to the Russians...The world is passing out of the era when the number of atom bombs is the crux of the matter and entering an era when the main problem will be to ensure by all means that the weapons can be delivered without prohibitive loss to the attacker.¹²¹

In essence, the Chiefs of Staff believed that as long as the West could pose a credible threat of massive retaliation, stability would be ensured regardless of how many nuclear weapons the Soviets possessed. There is evidence of contradiction in the Global Strategy Paper, however, in

¹¹⁷ Simpson, *op. cit.*, p. 170.

¹¹⁸ Freedman, *British Nuclear Targeting*, pp. 121-123. See also, Freedman, *Britain and Nuclear Weapons*, pp. 34-35.

¹¹⁹ Malone, *op. cit.*, p. 21.

¹²⁰ Wheeler, *op. cit.*, p. 73.

¹²¹ Macmillan and Baylis, *op. cit.*, pp. 31-32.

the sense that the Chiefs also thought it essential that the West maintain its atomic lead over the USSR.¹²² To the extent that British officials feared instability, it was ironically directed towards the United States, which was privately seen as more likely to initiate a nuclear war than the Soviet Union, so long as its homeland was not vulnerable to nuclear attack.¹²³

The advent of the H-bomb had an important effect on British nuclear thinking. The enormous increase in destructive power over the atomic bomb meant that even large countries with dispersed populations like the Soviet Union could be threatened with immense devastation. In this sense, thermonuclear weapons had become the “great leveler,” enabling a smaller power like the United Kingdom to more credibly deter the Soviet Union. As Churchill told the Parliament in March 1955:

...a curious paradox has emerged...the hydrogen bomb, with its vast range of destruction and even wider range of contamination, would be effective also against nations whose population hitherto has been so widely dispersed over large areas as to make them feel that they were not in any danger at all. They, too, become highly vulnerable; not yet equally perhaps, but, still, highly and increasingly vulnerable...Then it may well be that we shall by a process of sublime irony have reached a stage in this story where safety will be the sturdy child of terror, and survival the twin brother of annihilation.¹²⁴

Yet, not all were convinced that the H-bomb would enhance stability. As noted above, Rear Admiral Sir Anthony Buzzard, then director of naval intelligence, produced a critique of massive retaliation in 1953. He asserted that the strategy undermined stability because it gave each side a very strong incentive to get in the first blow and was out of all proportion to the issues at stake between the East and West. The Chiefs of Staff remained wedded to massive retaliation, however, but they did acknowledge that as the numbers of nuclear weapons available to each side grew, so too would the incentive to preempt. For the Chiefs, the answer was to be found in going nuclear “first and very early” in a conflict.

The Chiefs also speculated in 1953-1954 that as the two sides reached the stage where they could annihilate each other, an early articulation of mutual assured destruction or MAD, that realization could prove stabilizing provided the utmost effort was made to avert crises and conflicts with the USSR.¹²⁵ As noted earlier, the view that mutual vulnerability enhanced stability coexisted uneasily within British political and military circles with the conclusion that the advent of U.S. vulnerability undermined extended deterrence. It was also during this time that Sir Basil Liddell Hart provided the first articulation of the “stability-instability” paradox, noting that, “...to the extent that the H-bomb reduces the likelihood of full scale war it increases the possibility of limited war pursued by widespread local aggression.”¹²⁶

Overall, it remained the case that British military planners were loathe to accept any strategic notions that even implied that nuclear weapons could be used in a controlled and limited fashion for to do so, in their eyes, would dilute the threat of nuclear devastation, upon

¹²² Macmillan and Baylis, *op. cit.*, p. 33.

¹²³ Wheeler, *op. cit.*, p. 80.

¹²⁴ *House of Commons Debate, 1 March 1955, Hansard col. 1898-9*, excerpted in Poole, *op. cit.*, p. 138.

¹²⁵ Baylis, *op. cit.*, pp. 185-188, 193-194.

¹²⁶ Quoted in Paterson, *op. cit.*, p. 19.

which deterrence of major war ultimately rested. Accordingly, Britain preserved NATO's option of early nuclear use within the flexible response framework specifically in order to escalate a conflict quickly to strategic nuclear use. Notably, British planners did draw a geographic distinction to this proposition. The Chiefs of Staff were willing to accept in 1956 that tactical nuclear use in the Middle East and East Asia need not escalate to global nuclear war, presumably because the stakes involved on the periphery would be comparably lower than in the European theater.¹²⁷ British military planners also appreciated the importance of nuclear force survivability to the credibility of deterrence and thus stability. They undertook pioneering research into the use of hardened underground silos for ballistic missiles and went to great lengths to enhance the pre-launch survivability of its V-bomber force.¹²⁸

The modest strategic nuclear force posture maintained by Britain over the years underscores the extent to which British military planning has accepted the proposition that beyond a certain level of assured destruction, absolute numbers of nuclear weapons have no impact on stability. At their peak in 1962, Britain had an estimated 230 operational strategic warheads. Throughout the 1970s and 1980s the number of such warheads moved from less than 200 to about 128. Yet their configuration in Polaris re-entry vehicles meant that in reality no more than 64 targets could be engaged, and that was assuming all four Polaris submarines were on patrol.¹²⁹ The strategic rationale for this increasingly modest force posture can be traced to the mid-1950s, when the Joint Planning Staff which argued that:

The enormous scale of destruction caused by the Hydrogen bomb means that the ultimate stockpile required to ensure the defeat of any enemy is comparatively small and can be obtained quickly and reasonably economically.¹³⁰

While the Joint Planning Staff did not attach a specific number to this threshold, it indicated that the threshold could be achieved by the United States in 1954, the Soviet Union by 1955-1956, and by Britain between 1959 and 1964.¹³¹ It is possible that the JPS may have had in mind a figure of 100 H-bombs, the number Britain is estimated to have achieved in 1964.¹³²

To be sure a variety of factors beyond strategic reasoning have kept the British strategic nuclear force limited, not the least of which was the overarching deterrent provided by the United States. There were other, more technical factors such as the rapid obsolescence of the V-

¹²⁷ Baylis, *op. cit.*, pp. 229, 234.

¹²⁸ Pierre, *op. cit.*, p. 322.

¹²⁹ Freedman, "British Nuclear Targeting," p. 119. Of the 230, 60 were U.S. warheads deployed atop U.S.-provided Thor missiles, which were under "dual-key" custody, meaning that a British and American officer both had to insert their launch keys for the missiles to be fired. This arrangement was borrowed from the dual-key system used to protect the vault of the Bank of England. Baylis, *op. cit.*, p. 255. Within the British Air Staff, however, the Thor warheads would not have been counted as part of Britain's nuclear holdings. With the shift to the three-warhead Polaris A-3 missile in 1969-1970, the total number of warheads remained around 200. However, because these warheads could not be independently targeted, in reality only 64 targets could be engaged (i.e., the total number of Polaris missiles). With the subsequent shift to the Chevaline re-entry vehicle, the number of warheads per missile was believed to have been reduced to two, resulting in an operational warhead count of 128, whilst the number of possible targets remained at 64.

¹³⁰ Baylis, *op. cit.*, pp. 189-190.

¹³¹ *Ibid.*, p. 190.

¹³² Simpson, *op. cit.*, Appendix 4, p. 254.

bombers and the growing vulnerability of land-based ballistic missiles. Economics compounded matters, since Britain by herself could not afford to make the investments needed to help ameliorate these technical problems. As a consequence, in the late-1960s, Britain was left where it remains today, with a single, albeit highly survivable, strategic nuclear delivery system, the ballistic missile submarine.

APPENDIX: BRITAIN'S NUCLEAR FORCE POSTURE

The United Kingdom maintains a credible, albeit small, nuclear weapons capability consistent with its minimal deterrent doctrine. Having eliminated its air- and land-based nuclear weapons, Britain has only one remaining nuclear weapon system – the Trident submarine-launched ballistic missile.

The United Kingdom used to have eight squadrons of dual-capable Tornado GR.1/1A aircraft. However, the Tornado's nuclear role was terminated in 1998 when the last WE177 bombs were removed from service.¹³³ This ended 40 years of Royal Air Force nuclear missions.

Britain had four *Resolution* class ballistic missile submarines, which carried the U.S.-built Polaris submarine-launched ballistic missile. The *Resolution* was the first to deploy, from 1968 to 1994, with 61 patrols. The *Revenge* sailed from 1970 through 1992 after 56 patrols.¹³⁴ The *Renown* (completed 52 patrols) and the *Repulse* (completed 60 patrols) were retired in 1999.

The UK's present nuclear posture consists of four Trident submarines – the *Vanguard*, *Victorious*, *Vigilant*, and *Vengeance*. The *Vanguard* entered service in September 1993. *Victorious* entered active service in July 1995. The *Vigilant* followed in November 1996. *Vengeance* began her service in November 1999.¹³⁵ The Ministry of Defense has said that only one Trident submarine will patrol at a time, with the other three in various stages of readiness.

Britain's Trident submarines are based at the Clyde Submarine Base, Faslane, in Scotland. Warheads are stored, installed, and removed at Coulport. While Trident missiles can be loaded and unloaded at Coulport, this activity usually takes place at the Kings Bay Submarine Base in the United States.

Each Trident nuclear submarine carries 16 Trident II (D-5) missiles. The Trident II is a three-stage, solid-fuel missile with a 6,000 km-range and an accuracy that can be measured in meters.¹³⁶ As with Britain's Polaris missiles, its Trident missiles are manufactured and serviced in the United States.

The Trident II can carry up to 8 warheads, each with a yield of 100 kilotons. The Atomic Weapons Establishment (AWE) at Aldermaston builds the warheads for Britain's Trident missiles. Components for the nuclear weapons are transported to Burghfield and assembled. The warheads are reportedly similar to the U.S. Trident warhead, the W76.¹³⁷

¹³³ "Nuclear Notebook: French and British Nuclear Forces," *Bulletin of the Atomic Scientists* vol. 56, no. 5 (September/October 2000), pp. 69-71.

¹³⁴ *Ibid.*

¹³⁵ A.D. Baker III, *Combat Fleets of the World 2002-2003*, Annapolis, Maryland: Naval Institute Press, 2002, p. 877.

¹³⁶ United Kingdom. Royal Navy. "Trident-II D-5." *Submarines*. 2001. Internet: <http://www.royal-navy.mod.uk/content/177.html>.

¹³⁷ Butcher, Martin, Otfried Nassauer, and Stephen Young, *Nuclear Futures III: Western European Options for Nuclear Risk Reduction*. UK American Security Information Council and the Berlin Information-center for Transatlantic Security (BITS). BASIC/BITS Research Report 98.6. Internet: <http://www.basicint.org/nufu3-2.htm>.

It is generally believed that the Britain will only produce enough warheads to stock four Trident submarines, as this was common practice with the Polaris boats. Since the United Kingdom has announced that it will have fewer than 200 operationally available warheads and no more than 48 warheads per Trident, total warheads needed would be approximately 192, if all four submarines were fully loaded.¹³⁸ However, given the strategic and sub-strategic roles assigned to Trident, each submarine will carry approximately 36-44 warheads while on patrol, meaning the total warheads used would be approximately 160. The United Kingdom will probably keep an additional 15% in spares, making the total estimated stockpile 185 warheads.¹³⁹ It should be noted that the Strategic Defense Review excludes “missile warheads held as a necessary processing margin or for technical surveillance purposes” from the 200-warhead limit.¹⁴⁰ A 1998 source claims that, depending on future plans, 40-115 more warheads will be produced in addition to the 160 to be deployed.¹⁴¹

Since the current Labor Government perceives no direct threat to the United Kingdom, it originally did not want any Tridents to go on patrol. However, it was decided that one Trident submarine should be patrolling at all times out of concern that the return to a patrolling posture during a crisis could further exacerbate the situation. Defense officials also debated having any nuclear warheads on the Trident submarines. The Ministry of Defense concluded that de-mating warheads would not be in the best interest of the United Kingdom because this could similarly aggravate an existing situation if and when the warheads were moved back aboard the boats.¹⁴²

In 1998, the British government anticipated that the Trident submarine would need to remain operational for up to 30 years.¹⁴³ Therefore, the Trident is expected to be operational through 2025. Britain does not presently have any plans on the drawing board to replace the Trident and, politically, it may be several years before London considers a successor system.¹⁴⁴

¹³⁸ Stockholm International Peace Research Institute (SIPRI). “Country Profile for UK 1999 – Nuclear Forces.” Internet: http://first.sipri.org/db/iris_start3.

¹³⁹ *Ibid.*

¹⁴⁰ Butcher, Martin, Otfried Nassauer, and Stephen Young, *op. cit.*

¹⁴¹ Arkin, William, Robert S. Norris, Joshua Handler. “Taking Stock: Worldwide Nuclear Deployments 1998,” *Natural Resources Defense Council*, March 1998. Internet: <http://www.nrdc.org/nuclear/tkstock/download.asp>.

¹⁴² Speech by the Secretary of State for Defense, the Right Hon George Robertson MP, “Nuclear Disarmament in the Modern World,” March 1, 1999. Internet: <http://www.fas.org/sgp/news/mod030199.html>.

¹⁴³ U.K. Ministry of Defense. “Deterrence and Disarmament” (Chapter 4), *Strategic Defense Review*, 1998. Internet: <http://sun00781.dn.net/nuke/guide/uk/doctrine/sdr98/chapt04.htm>.

¹⁴⁴ *Ibid.*

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FRANCE

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Overview

The foundations of France's nuclear doctrine were laid in the turbulent political aftermath of the Second World War, and both its strategy and force posture were shaped by the challenging realities of a post-war economy. Although initially driven by the agenda and personality of Général Charles de Gaulle and of several of his prominent military advisors – who were focused on guaranteeing French security and protecting French "vital interests" without assistance from the United States, by building a nuclear force that was both independent and credible – France's nuclear deterrence strategy and doctrine have remained remarkably consistent throughout the past half century. The French deterrent remains purely defensive – threatening credible retaliation – and continues to form the cornerstone of the overall French national defense strategy, with forces maintained at a level of strict sufficiency and supported by a limited budget. As French Defense Minister Michèle Alliot-Marie recently stated, "There is no question of [France] renouncing its guarantee of both sufficient and perennial means of deterrence.... Our security... rests fundamentally on the concept of nuclear deterrence."¹

French nuclear strategy and force posture were predicated initially on an assumed imminent threat from the Soviet Union, described in the literature as a "great power" adversary. A cornerstone of early French doctrine, "la dissuasion du faible au fort" (deterrence of the strong by the weak) was centered around this asymmetric relationship. Today, in the absence of a comparable foe, deterrence is focused more on the ability to dissuade potential "regional power" enemies from threatening French interests. Specifically, the French nuclear deterrent is aimed at nations engaging in the development of weapons of mass destruction (WMD). Another critical component of French doctrine – the notion of "la défense tous azimuts" or omnidirectional defense – has arguably increased in relevance in the post-Cold War period, providing continuity in the commitment to flexibility in nuclear targeting. The notion that a small number of weapons is sufficient to the task of protecting French vital interests persists in this new context. The French deterrent continues to be guaranteed not only by very public leadership resolve to use nuclear weapons if French interests are threatened, but also by a deterrent that has consistently been perceived as credible, even as it grew to a modest triad and subsequently was downsized to an air- and sea-based diad. French strategists today also uphold de Gaulle's belief that deterrence guarantees both regional and international stability, and that this stability can only be assured if a force is maintained at levels of strict sufficiency, with a purely defensive purpose.

The analysis that follows examines the development of French nuclear doctrine, strategy, and force posture, with a particular focus on their rationales. It discusses the political, economic, technical, historical, and security factors that had the strongest influence on the evolution of French nuclear plans in the 1940s and 1950s, along with the underlying threat perceptions.

¹ The original French text reads, "Il n'est pas question pour nous de renoncer à garantir la suffisance et la pérennité des moyens de la dissuasion.... Notre sécurité... s'appuie essentiellement sur la dissuasion nucléaire." "Michèle Alliot-Marie Annonce une Modernisation de l'Arsenal Nucléaire Français", *Le Monde*, 13 July 2002.

Gradual changes (and noteworthy consistencies) in these assumptions, threat perceptions, and technical considerations are evaluated and their context explained. The analysis is rounded out with an assessment of targeting considerations from the 1950s through the present day; an evaluation of the French approach to communicating their nuclear deterrent, noting the important distinction between public and private communications; and a broader discussion of crisis stability at low levels of nuclear weapons.

To provide the greatest possible accuracy in analyzing the origins and development of French nuclear deterrence doctrine, strategy, and force posture in their proper historical context, this paper draws almost exclusively on primary sources. Almost all texts reviewed were in the original French, and the translations of citations provided in this paper are the SAIC author's.² Supplementing these primary texts was a series of interviews with current French nuclear experts who have studied the primary source literature extensively, and all of whom have been (or still are) either tangentially or directly involved in the formulation of French nuclear doctrine and strategy. These interviews were conducted in Paris in November, 2002, entirely in French. Experts interviewed include a prominent academic, formerly a strategic advisor to the French Ministry of Defense and the French mission to NATO; a retired Navy admiral, formerly Head of French Nuclear Forces, currently serving as a senior advisor at the Atomic Energy Commissariat; a former nuclear submarine captain, currently senior advisor to the Director of Strategic Affairs, Ministry of Defense; a prominent academic, currently Senior Technical Advisor to the Defense Minister; and a practicing lawyer, formerly senior legal counsel to the Ministry of Foreign Affairs and the Atomic Energy Commissariat.

Two excellent compilations of primary texts and sources have been published in France and were consulted to supplement the author's research and interviews. The first is François Géré's seminal comparative analytical review of the early writings of Generals Gallois, Beaufre, Ailleret, and Poirier, entitled "Four Generals and the Apocalypse". The second is Dominique David's extensive compilation of French defense literature (primary texts and original documents) entitled *France's Defense Policy: Texts and Documents*. Citations for these two works, which exist only in their original French versions, can be found in the bibliography. In addition, considerable insights were gleaned from the DTRA-sponsored high-level meeting of senior French and British nuclear experts at the International Institute for Strategic Studies (IISS) in London, November 20, 2002, entitled "Deterrence at Low Levels of Nuclear Weapons: A Reappraisal". A comprehensive thematic summary of this meeting is attached as an appendix and is an important supplement to the analysis herein. Per Chatham House Rules, both the conference summary and the comments and interviews referenced herein are non-attributive.

An important finding in both the expert interviews and the meeting at the IISS concerns the limitations of certain sections of the existing literature on French nuclear deterrence, particularly with respect to English-language translations and to more recent academic writings in both French and English. Translation difficulties emerge primarily in the English-language literature produced in the United States, and are evident on two levels: first, unintentional mistranslations of highly technical French terminology or of more conventional but highly nuanced French words; and second, translations biased by perspective or by time. Examples include the frequent English-language reference to "proportional" deterrence as a core piece of

² The author is a native French speaker who lived and studied in Paris for 15 years.

French nuclear doctrine, and the sometimes inappropriate use of the term "prestrategic" to characterize France's "ultimate warning" capability.³ Along similar lines, modern writings even by French experts frequently draw upon conventional wisdom rather than primary texts, and result in inaccurate interpretations of events in the 1940s and 1950s.⁴ For this reason, the analysis that follows is based almost exclusively on primary sources, many of which are not available in translation and can be found only in the French national archives or French academic libraries. These sources were supplemented by more recent analyses written exclusively by respected French academics with direct experience in French nuclear policy review and formulation, or, exceptionally, by British or American experts such as Malcolm Chalmers or David Yost, whose writings are largely endorsed by the French community of experts.

I. Origins and Early Development of French Nuclear Strategy, Doctrine, and Force Posture

A. Motives and Assumptions

French nuclear doctrine and strategy began to take shape in the 1940s and 1950s under the leadership and advisement of Général Charles de Gaulle. They were driven initially by the country's historically strong nuclear physics research capabilities and by the complex legacy of World War II, and were reinforced and refined in the early-1950s following several pivotal international crises. The key assumptions that drove the establishment of the French nuclear program and the evolution of French nuclear doctrine, strategy, and force posture stemmed from a mutually-reinforcing set of political, economic, and technological factors. The personality and charisma of de Gaulle, as well as the prominence and intellectual foresight of four of his most important military advisors – future Generals Pierre Gallois, Charles Ailleret, Lucien Poirier, and André Beaufre – were critical factors in the formulation of French doctrine and strategy in the

³ The notion of "proportional" deterrence is an English translation of "la dissuasion du faible au fort" (deterrence of the strong by the weak). The concept in fact does not rest on strict proportionality and many French experts reject the terminology. The mistranslation stems from the original writings of Général Gallois, where he referred to proportionality in the context of *damage* rather than of deterrence itself. It should be noted that some more recent French academic writings utilize the term "proportionnelle", but usually in a very specific context. Similarly, the term "prestrategic" was used in French deterrence vocabulary only for a brief period during the 1980s. The concept was referred to as "tactical warning" prior to 1984, and as "ultimate warning" both during and after the Cold War. The implications of the evolution of this terminology are important, but more recent texts use "prestrategic" liberally, which does not accurately reflect the progression of the French debate. Lastly, the term "flexible response" is sometimes provided as an English translation of the flexibility required by the concept of omnidirectional defense. In fact, a more appropriate translation would be "flexible targeting", which would also avoid confusion with the very distinct British and American doctrines of "flexible response".

⁴ The most salient example, and one which fundamentally changes an analysis of the underpinnings of French nuclear deterrence, is the frequent reference in both American writings and more modern French writings to "prestige" as the core rationale behind the development of the French nuclear program. In fact, this term, or even a discussion of the concept, does *not* appear in any of the early writings and primary texts except in passing. It is an explanation that was developed by historians seeking to interpret France's quest for nuclear weapons as a status symbol, or retroactively applying Charles de Gaulle's concept of French "grandeur" (greatness) – which was a cornerstone of his foreign policy in the 1960s – out of context. As this paper makes clear, security and independence were the two primary drivers in the early articulation of French nuclear doctrine; "prestige" ranked very low on the list of rationales.

early years.⁵ Many of their initial assumptions have endured to this day. French nuclear doctrine was never formally articulated until the publication of the first French White Paper on National Defense in 1972, but the writings of the early strategists clearly laid the groundwork for this seminal national document.⁶

France was no stranger to the complexities and potential promise of nuclear fission for both peaceful and military uses; in fact, France was a pioneer in many areas of atomic research. Three patents that demonstrated this understanding were filed as early as May 1939, the result of a comprehensive research program involving such scientists as Frédéric Joliot, Hans von Halban, Lew Kowarski, and Jean Perrin. These were the first patents ever to be taken out by any country on the chain reaction in uranium – two on energy and one on explosive devices.⁷ In late 1939, Joliot submitted a report to Minister of Armaments Raoul Dautry, suggesting the production of an energy generator, based on a nuclear (heavy water + uranium) chain reaction, "as a first step towards a possible submarine engine."⁸ Dautry agreed to provide "all financial means necessary" to support such an endeavor.⁹ France gradually became involved in international nuclear fission efforts in the United Kingdom, the United States, and Canada, through the participation of Bertrand Goldschmidt, Hans von Halban, Lew Kowarski, and later Pierre Auger under the auspices of the Maud Committee (Great Britain) and the Montreal Laboratory (Canada), as well as at the University of California at Berkeley and the University of Chicago, working with Manhattan Project scientists such as Enrico Fermi.¹⁰ As a result, the French had a robust understanding of the work carried out by the Americans and the British, and later were able to accurately analyze the motivations behind the emergent American nuclear force posture. Several French atomic pioneers became key players in the Commissariat à l'Énergie Atomique (CEA, discussed later in this chapter) when it was founded in 1945.

B. Threat Perceptions

The perception of a threat from abroad was very real. In addition to the paranoia about a resurgent Germany that resulted from the legacy of two world wars, France felt the proximity of the Soviet Union acutely – the USSR was only "à deux étapes du Tour de France" ("only as far

⁵ De Gaulle's influence during much of the Fourth Republic (1945-58) is noteworthy, as he was only head of state during the first year of the Provisional Government (1945-46), then resigned. He did not return to power until the 5th Republic was inaugurated in 1958, and remained President until 1969. During his 12-year absence from Paris, de Gaulle formed the "Rassemblement du Peuple Français" party and remained actively in contact with French leaders and with representatives of French public opinion.

⁶ *Livre Blanc sur la Défense*, 1972, available in English translation as the *French White Paper on National Defense*, French Embassy, Press and Information Division, New York, 1972.

⁷ Bertrand Goldschmidt, "How it All Began in Canada: the Role of French Scientists," *Proceedings, Special Symposium: 50 Years of Nuclear Fission in Review, volume 1*, 29th Annual Conference of the Canadian Nuclear Association and 10th Annual Conference of the Canadian Nuclear Society, Ottawa, Ontario, 5 June 1989. For a first-hand account and in-depth discussion of the French nuclear fission program, see Bertrand Goldschmidt, *Pionniers de l'Atome* (Paris: Stock, 1987).

⁸ Goldschmidt, "How it All Began in Canada", *op.cit.*

⁹ Gérard Jouve, *Voici l'Age Atomique* (Paris: éditions Franc-Tireur, 1946), as cited in Roger Belbéoch, "Le C.E.A.: Sa Raison d'Être, la Bombe. Son Alibi, La Recherche," *Gazette Nucléaire*, 147/148, 1996. The full original citation from Dautry is "C'est à ce moment que j'eus à intervenir comme ministre de l'Armement pour mettre à la disposition de M. Joliot-Curie tous les moyens dont il pouvait avoir besoin." The translation is the SAIC author's.

¹⁰ The participation of these French scientists in international research was discussed by French nuclear experts at the DTRA/ISS meeting, November 2002. See also Goldschmidt, *Pionniers de l'Atome*, *op.cit.*

away as two legs in the Tour de France cycling race").¹¹ The Soviet thermonuclear explosion of 1953 only compounded this fear; the sense of a "sudden and constant danger" posed by the threat of a nuclear attack from abroad dominated the French defense discourse.¹² In the early years, the French dismissed the idea of an early nuclear strike by the Soviet Union. The general perception was that the conventional superiority of the Warsaw Pact was such that nuclear weapons would only be invoked as a weapon of last resort. It gradually became apparent that Soviet doctrine did involve the possibility of preemptive nuclear strikes, which reinforced the importance for France of deterring not only a 1940-style invasion, but also the use of nuclear weapons by the Soviet Union under any circumstances.¹³ While the USSR was perceived as the main threat to French interests, it is noteworthy that official French documents did not name the USSR as the actual threat until the late 1970s, referring instead simply to an "adversary" or a "great power". By contrast, both the United States and the United Kingdom designated the Soviet Union by name as early as the late 1940s.¹⁴

C. Security Factors

Protecting "vital interests" and guaranteeing security are factors that appear consistently throughout the early literature on French nuclear deterrence. The arguments are multifaceted and emerged first and foremost from France's experience in World War II, and the emotional legacy for those who fought under the Free French and with the Allies – led by de Gaulle, and including future Generals Gallois, Poirier, Beaufre, and Ailleret, all members of the French Resistance. Echoing the views of French nuclear experts who have closely studied primary texts from the 1940s and 1950s, François Géré recently wrote, in his survey of documents written by the four Generals: "All of them shared the common experience of the 1940 defeat and subsequent humiliation of France, which none of them had accepted, but which drove all of them to believe intensely that from this point on, no means should be spared to ensure that such a disaster could never occur again, ever."¹⁵

It is interesting to note the consensus among these four military players, given their diverse backgrounds and their salient role in the formulation of French nuclear doctrine. Three of them had been in the French Army and one (Gallois) in the French Air Force. Gallois was also the one who was the most focused on the correlation between the political and strategic dimensions of a potential deterrent, and thus was arguably the most influential of the four.

¹¹ French nuclear expert, DTRA/IISS Workshop, November 2002.

¹² *Ibid.*

¹³ Author's interview with a French nuclear expert, Paris, November 2002.

¹⁴ The United Kingdom first named the USSR as its greatest potential enemy in late-1947.

¹⁵ The original text reads: "On remarquera qu'ils ont tous en commun l'expérience de la défaite de 1940 et de l'humiliation de la France qu'aucun n'accepta mais dont ils ont pensé profondément qu'il fallait désormais tout faire pour que semblable désastre, jamais, ne puisse se reproduire." François Géré, "Quatre Généraux et l'Apocalypse: Ailleret-Beaufre-Gallois-Poirier," *Revue Stratégique*, No. 53, 1992. The translation is the SAIC author's. This view was echoed by all French experts at the DTRA/IISS workshop, as well as by additional experts interviewed in Paris (November 2002). One expert at the French MoD stressed the psychological importance of the 1940 invasion, noting that this defeat represented not only the third occupation of France in less than a century, but also an embarrassment for the French Army; "bad behavior" on the part of not only the French leadership but also many French citizens; and a situation where close allies – namely the United States and Great Britain – turned a blind eye and, eventually, "arrived late". An interesting consequence is that all major French political figures from the 1940s through the 1980s were former members of the French Resistance.

Ailleret was more technically oriented – he was a graduate of the prestigious French École Polytechnique – and thus more concerned with the tactical dimensions of French nuclear strategy. Beaufre and Poirier were more interested in the theory of deterrence, Beaufre as an advocate of NATO, and Poirier as an advocate of France.¹⁶ Other non-military advisors to de Gaulle such as Bertrand Goldschmidt, who had been forced to carry out his groundbreaking work in nuclear fission in exile (Jews were not allowed to carry out research under the Vichy régime), and who had first-hand experience with the American nuclear program, were instrumental in helping French leaders understand the importance of reviving France's atomic research capabilities.¹⁷

The need to guarantee security was thus evident on many levels, and formed the basis of a strong consensus among the key personalities who shaped French deterrent doctrine. At the core of this objective was the protection of French "vital interests", defined as the "national sanctuary and territorial integrity"¹⁸ – which referred not only to the territory limited by French borders, but also to de Gaulle's interests abroad, specifically French colonies.¹⁹ De Gaulle later came to include the six countries of the European Community in his vision of security guarantees, based on the assumption of common European defense interests.²⁰ The protection of "vital interests" continues to be listed as one the primary justifications for a deterrent capability today, and is cited frequently in French public discourse. It is interesting to note a contrast between France and the United Kingdom that devolved from their wartime experiences and their respective perceptions of security. During the Second World War, while France was invaded, the United Kingdom was bombed from the air. Consequently, one of the main motivations for France's deterrence doctrine and resultant force posture was to deter an invasion; the objective in the United Kingdom, on the other hand, was to deter a counter-city strike.

Because the rationale for adopting a nuclear deterrent capability was predicated upon the need to guarantee security and to protect vital interests, the French deterrent, by its very nature, was designed to be (and remains) purely defensive. Leaders from de Gaulle to Chirac have rejected the notion of nuclear warfighting as well as the hypothetical use of nuclear weapons in the context of a conventional military campaign strategy. The central tenets of French nuclear

¹⁶ François Géré, *op.cit.*

¹⁷ An excellent obituary for Bertrand Goldschmidt from *Le Monde*, "Décès de Bertrand Goldschmidt, un des pionniers français de l'énergie atomique", *Le Monde*, 15 June 2002, describes a secret meeting with de Gaulle in Ottawa in 1944, at the conclusion of which the General "understood clearly" Goldschmidt's message about nuclear potential and the need to restore France's formerly pioneering research program.

¹⁸ For a description of the early thinking on the French notion of a "sanctuary", see Lucien Poirier's definitive work on French nuclear strategy, *Des Stratégies Nucléaires* (Paris: Hachette, 1977).

¹⁹ French nuclear expert, DTRA/IISS Workshop, November 2002. As discussed in our introductory chapter, the notion of a "sanctuary" has found its way into the writings of more recent nuclear weapon states such as India, Iraq, and China.

²⁰ The original six were Belgium, France, West Germany, Italy, Luxembourg, and the Netherlands. De Gaulle suggested that "the French strike force would provide... a nuclear guarantee to all six." The original French text reads, "la force de frappe française apporterait par la force des choses une garantie nucléaire à l'ensemble des six." The translation is the SAIC author's. De Gaulle is quoted in Loïck Benoit, "François Mitterrand et la Défense Nucléaire de l'Europe," *Revue de Recherche Juridique – Droit Prospectif*, N°XXIII/73, pp. 639-653, Presses Universitaires d'Aix-Marseille, 1998. The French definition of its sanctuary has also broadened in modern discourse to include other European countries such as Germany.

doctrine therefore have flowed from the fundamentally defensive nature of the proposed deterrent.

D. Political Factors

The personality of de Gaulle, and the mutual distrust between him and successive American leaders, were critical factors in the formulation of French nuclear deterrence doctrine.²¹ De Gaulle's broader political agenda in the 1950s was aimed at transforming France's role internationally in the aftermath of the French war experience.²² In addition, several events in the immediate post-war period convinced him that the core security imperative of protecting French vital interests could only be achieved through a French defense capability that was independent of its allies. This post-war chain of events included the Korean War (1950-53), which raised the red flag of the dangers of getting drawn into American conflicts and all-out wars that France could not afford; conflict and unrest in French colonies, in particular Indochina, where the French suffered a crushing defeat at Dien Bien Phu at the hands of the Viet Minh in 1954, after an appeal to the United States for military assistance by Général Navarre was turned down by President Dwight D. Eisenhower;²³ and above all, the Suez Crisis of 1956, in which the perceived American betrayal of French and British forces had a profound influence on the substance of the Fifth Republic's defense doctrine and became a catalyst for the public debate on deterrence.

Thus, from their inception, French nuclear doctrine and strategy were predicated on Charles de Gaulle's firm belief that neither the United States nor NATO could be trusted to provide a reliable security guarantee or to protect French vital interests. Establishing a French nuclear weapons program was considered one of the few viable pathways to securing both credibility and independence in matters of defense and international security.²⁴ The move to

²¹ De Gaulle's military plans for France had been marginalized by the Americans during World War II, when Franklin D. Roosevelt favored Général Henri Giraud to head the exiled French army in 1942. This decision proved ill-founded, when Giraud failed to galvanize the French military and resistance movements. For an interesting discussion of Giraud and tensions with the Americans, see Charles de Gaulle, *Mémoires de Guerre, Tome III: Le Salut 1944-1946* (Paris: Plon, 1959), translated as *War Memoirs, Volume III: Salvation 1944-1946* (New York: Simon and Schuster, 1960).

²² For an exceptional analysis of de Gaulle's broad vision of new "greatness" for France, please see Maurice Vaïsse, *La Grandeur: Politique Étrangère du Général de Gaulle (1958-1969)* (Paris: Fayard, 1998).

²³ A handful of advisors in the Eisenhower Administration, in particular Chairman of the Joint Chiefs of Staff Admiral Arthur Radford and Secretary of State John Foster Dulles, favored intervention in Indochina in support of the French. There was even a brief informal discussion of the possibility of using tactical nuclear weapons against the Viet Minh, although this option was never seriously considered either by the French or by the Americans. For an interesting discussion of the Franco-American deliberations concerning Dien Bien Phu, see *The Pentagon Papers*, Gravel Edition, Volume 1, Chapter 2, "U.S. Involvement in the Franco-Viet Minh War, 1950-1954" (Boston: Beacon Press, 1971).

²⁴ For Général Gallois' discussion of the ability of nuclear weapons to insure an independent French defense policy, see Pierre Gallois, "Les Conséquences Stratégiques et Politiques des Armes Nouvelles", *Politique Étrangère*, no. 11, 1958. It should be noted that not all French military leaders agreed with de Gaulle's perspective; in fact, there was a vigorous debate in French military circles over the best approach to guaranteeing French security, with a handful of leaders favoring a French "Atlantic Alliance". For a discussion of opposition to the *force de frappe*, see Général Paul Stehlin (former Chief of Staff of the French Air Force), *La Force d'Illusion* (Paris: Laffont, 1973) and the writings of Jules Moch (Socialist Minister of Defense, 1950-51), who summarizes some of the left-wing opposition to de Gaulle's ideas in his autobiography *Une Si Longue Vie* (Paris: Laffont, 1976).

create an independent French nuclear force in the late-1950s, and the later withdrawal from NATO's Integrated Command in 1966, were two sides of the same coin, and resulted from the same initial chain of events in the 1940s and early-1950s. Independence became a cornerstone of French doctrinal, strategic, and tactical thinking. In addition, it is important to note that as the development of the French nuclear program progressed, France posited its nuclear strategy not only as independent from the United States' and NATO's, but also as *doctrinally distinct*, particularly in asserting the purely deterrent quality of its forces.

A final political consideration, articulated specifically by Général Gallois, was the opinion that French nuclear deterrence was not compatible with alliances. Much of his rationale, however, was based on the limitations and options imposed by a "strategy of means" (discussed in the following section), and the view that alliances created expensive commitments.²⁵ Charles de Gaulle was willing to coordinate with allies, but not to sacrifice the independence of French decisionmaking.

E. Economic Factors

The French post-war economy presented several critical challenges to the Provisional Government. Among the immediate imperatives was the need to redress the French post-war energy deficit. As noted above, the French nuclear physics community included many pioneers, and the potential of nuclear energy was clear. The Commissariat à l'Énergie Atomique (CEA) was established by Charles de Gaulle in October 1945, ostensibly to oversee the evolution of this capability and to help reduce French dependence on foreign energy imports. The CEA bridged the civil, scientific, and military domains, and as the work of the Commission progressed, military imperatives – the true purpose of the CEA in its early years – quickly overtook economic and energy considerations.²⁶ The potential of a nuclear deterrent was not lost on either the scientific or political communities; as in the United Kingdom, the discourse in France clearly pointed to the belief that in the face of current threats, no internationally significant country should be without a nuclear capability of its own.²⁷ The CEA worked to make that vision a reality for France.

Flowing from de Gaulle's political rationale for an independent French deterrent capability was the obvious implication that France, in contrast to the United Kingdom, would not receive any direct support (either technical or financial) from the United States. In the words of

²⁵ Général Pierre Gallois, *Stratégie de l'Age Nucléaire* (Paris: Calmann-Lévy, 1960), translated as *The Balance of Terror: Strategy for the Nuclear Age* (New York: Houghton Mifflin 1961).

²⁶ For an authoritative account of the military history of the CEA, see Jean-Damien Pô, *Les Moyens de la Puissance: Les Activités Militaires du CEA (1945-2000)* (Paris: Fondation pour la Recherche Stratégique, Éditions Ellipses, 2001). An excellent overview also is provided by Bertrand Goldschmidt (who directed the CEA's work for many years) in *L'Aventure Atomique* (Paris: Fayard, 1962), and *Pionniers de l'Atome, op.cit.* Nuclear energy did not emerge as a true pillar of the French economy until 1965, although it persisted, and still accounts for 80% of French electricity production today.

²⁷ Admiral Raoul Castex, another founding father of French strategic thinking on nuclear weapons and nuclear deterrence, clearly articulated the notion of nuclear weapons as an "equalizing" force and an asset that should be contemplated specifically by "medium-sized" nations. His thoughts are collected in the posthumous *Mélanges Stratégiques*, originally published in a limited printing in 1976, and later reproduced as volume VI of his earlier *Théories Stratégiques* (Paris: Économica, 1996). This reference was provided by a French nuclear expert in an interview with the author, Paris, November 2002.

French expert Maurice Vaïsse, "French nuclear doctrine could only be built from the means that existed."²⁸ Thus, due to fiscal necessity as well as technical considerations, the French nuclear doctrine was one of *strict sufficiency*, and the strategy that flowed from this doctrine was a *strategy of means*. Unable to posit itself as a superpower, France adopted a nuclear arsenal as its ultimate safeguard.²⁹ French force posture, discussed later in this chapter, evolved accordingly. Means also shaped targeting; it was impractical, economically, for France to consider a more complex doctrine than counter-city targeting.

F. Technical Factors

Several important technical considerations both flowed from and fed the assumptions that drove the early formulation of French nuclear doctrine and strategy. The primary consideration, reflecting both political and economic realities, was that nuclear weapons are inherently powerful enough that only a small force is needed to provide a credible deterrent. Even a minimal number of nuclear weapons would provide sufficient credibility to warrant French consultation in matters of international strategic importance. Such weapons thus presented clear advantages over conventional forces; their effects were immediate and massive and, in the words of Général Ailleret, they provided "good value for money".³⁰ In other words, this technical capability offered an affordable means of assuring the defense of French vital interests. One example is that the initial fleet of nuclear-equipped submarines was built "on a wing and a prayer"; the investment represented only 15% of the French defense budget, itself only 3-4% of French GDP. Thus a very modest upfront investment was successful in providing France with significant international input.³¹ Perhaps most importantly, the overall French nuclear capability (the *force de frappe atomique* or nuclear strike force) was perceived by de Gaulle and by those who came after him as a *political asset* rather than a strategic weapon system. Its value was far greater than its mere technical potential.

French doctrine stipulated that a nuclear strike was not an extension of conventional war. France consistently espoused a "no first use" policy, except in very rare "prestrategic" conditions (see below). French nuclear delivery systems were developed officially for the defense of French territory, and the purely defensive nature of the deterrent dictated France's force posture. The centerpiece of French nuclear doctrine, first articulated by Général Pierre Gallois, was "la dissuasion du faible au fort" (literally, deterrence of the strong by the weak, often translated as "proportional deterrence").³² The primary tenet was that the French arsenal needed to be capable

²⁸ Maurice Vaïsse was quoted here by a French nuclear expert at the DTRA/IISS Workshop, November 2002. For Vaïsse's analysis of French nuclear deterrence, including a discussion of the "strategy of means", see Maurice Vaïsse, *La France et l'Atome: Études d'Histoire Nucléaire* (Brussels: Bruylant, 1994).

²⁹ The economic price of nuclear independence should not be understated. Although there are no formal public estimates of the total cost of the French nuclear program in the early years, it is clear that the funds came primarily from budgets otherwise allocated to conventional forces and non-nuclear technological research. Thus the decision to develop a nuclear deterrent was unpopular with both the military and public opinion, and delayed important economic advances in France such as the establishment of a modern telecommunications system. This analysis was provided by a French nuclear expert at the DTRA/IISS Workshop, November 2002.

³⁰ Charles Ailleret, "L'Arme Nucléaire, Arme à Bon Marché", *Revue de Défense Nationale*, October 1954.

³¹ These figures were provided to the author by a French nuclear expert, Paris, 26 November 2002.

³² This concept is outlined in Général Gallois' seminal book, *Stratégie de l'Age Nucléaire*, *op.cit.* Gallois firmly believed that the doctrine of deterrence of the strong by the weak was both possible and credible. Again, here, according to French experts, the English-language translation of this concept as "proportional" deterrence is a bit of

of striking targets and inflicting a level of damage that represented at least the equivalent of France's own economic and strategic value. Gallois' concept proved to be one of the most resilient in French nuclear doctrine.

Deterrence of the strong by the weak was predicated upon three main preconditions:

- First, that the French deterrent was both credible and survivable;
- Second, that French vital interests were perceived to be at stake (Lucien Poirier posited a "threshold of aggression", also sometimes described as a "nuclearization threshold", beyond which the survival of France as a nation would be brought into question);³³ and
- Third, that command and control structures were adequate, namely, that the French leadership was *willing* to use nuclear weapons and technically capable of launching them.

Général Charles Ailleret extended this doctrine to include the concept of "la défense tous azimuts" (omnidirectional defense), which suggested that the flexibility of French response to global threats was guaranteed by independent nuclear capabilities that had a "worldwide scope".³⁴ Specifically, Ailleret envisaged "a defense system directed against no one, but rather global and omnidirectional, with the maximum power permitted by national means, and which, handled skillfully and with as much cold-bloodedness as resolve, should, through sheer deterrence, allow [France] to avoid several great wars and, if it cannot avoid them, to take part in them under the best possible circumstances; and finally which, during crisis situations that may shake the world in the future, would put France in a position where it could freely choose its own destiny."³⁵ While the reach of the French arsenal never became truly global (Pluton missiles, for example, only had a range of 120 km, and the Hadès missiles had a range of 320 km, allowing them to reach as far as East Germany, so the "reach" depended on the airborne and sea-based nuclear components), the concepts of flexibility and omnidirectionality persist and are arguably even more important today than they were in the 1960s.

Thus France's nuclear force posture was essentially strategic. The only exception was the potential "prestrategic" use of nuclear weapons, which would consist of a single nuclear strike, to serve as the "ultimate warning" ("l'ultime avertissement") when the threat to French interests was perceived as allowing no other solution. The prestrategic clause is the only scenario that envisages the use of tactical nuclear weapons by France, and also is the only example of counter-force targeting in the publicly available literature.³⁶

a misnomer. Proportionality is only *implied*. Gallois himself used the French word "proportionnelle" in first articulating this doctrine, but it was primarily in reference to the notion of proportional damage.

³³ The original text reads, "seuil d'agressivité" and "seuil de nucléarisation". The translations are the SAIC author's. Lucien Poirier, *Des Stratégies Nucléaires* (Paris: Hachette, 1977), p. 323.

³⁴ Charles Ailleret, "Défense 'dirigée' ou défense 'tous azimuts'?", *Revue de Défense Nationale*, December 1967.

³⁵ The original text reads, "un système de défense qui ne soit dirigé contre personne, mais mondial et tous azimuts, qui ait la puissance maximum permise par ses ressources nationales et qui, manié avec autant de sang-froid que de détermination, devrait, par la dissuasion, lui permettre d'échapper à certaines grandes guerres et, s'il n'y échappe pas, d'y participer aux meilleures conditions; enfin qui, au cours des crises qui peuvent dans l'avenir ébranler le monde, mettrait la France en mesure de déterminer librement son destin." The translation is the SAIC author's. Charles Ailleret, "Défense 'dirigée' ou défense 'tous azimuts'?", *op.cit.*

³⁶ The term "prestrategic" was first used in 1984; prior to that, the concept was known as "tactical warning". Since the end of the Cold War, the term "prestrategic" has not been used (François Mitterrand pointed out that in the new environment, all weapons are considered strategic), but the concept of providing an "ultimate warning" still forms a

In sum, the behaviors France was seeking to deter with its nuclear capability were direct threats to French survival; the escalation of conflicts that might threaten French vital interests; and diplomatic coercion by other nations (resulting, for example, from excessive dependence on another country's policies – in particular the United States). In the words of André Beaufre, "Deterrence is designed first and foremost to safeguard peace and the territorial status quo, however it also will be required to prevent myriad adverse actions, to limit the scope or the intensity of a conflict, and potentially to paralyze any act that puts an allied undertaking at risk." Deterrence has a "multifaceted role... from the most defensive of intentions to its supporting influence on acts that are fundamentally offensive in nature."³⁷ There was a more subtle domestic dimension to deterrence as well, which was the need for improved civilian control over the military. This imperative became apparent with the troubles in Algeria (then a French colony) in the 1960s.³⁸

II. Changes in Assumptions, Threat Perceptions, and Technical Considerations Since the 1950's

One of the most significant aspects of French nuclear deterrence doctrine and strategy is the striking consistency of many of their central security and political tenets over time. While some concepts such as deterrence of the strong by the weak lost some of their relevance in the post-Cold War era in the absence of a "great power" adversary, others such as omnidirectional defense (and the attendant varied and flexible targeting capabilities) increased in importance.

In the years following the collapse of the Soviet Union, the notion of deterrence of the strong by the weak has evolved into a doctrine that is somewhat more multifaceted. Deterrence, for example, is now perceived to be required against proliferants, i.e., countries in the process of acquiring WMD, if these countries pose a threat to French survival. These countries are perceived as regional power adversaries rather than great power adversaries. This argument was made in the 1994 Paper and reiterated by President Jacques Chirac in June, 2001, when he stated that "deterrence is our best protection against proliferation", be it nuclear, chemical, or biological.³⁹ Thus perceptions of threats to French vital interests continue to drive the

cornerstone of French nuclear strategy. For a good discussion of the evolution of this terminology, see David Yost, "Nuclear Weapons Issues in France" in John C. Hopkins and Weixing Hu, Eds., *Strategic Views from the Second Tier: the Nuclear Weapons Policies of France, Britain, and China* (San Diego: Institute on Global Conflict and Cooperation, University of California, San Diego, 1994).

³⁷ The original text reads, "On demandera à la dissuasion d'abord de maintenir la paix et le statu quo territorial, mais on lui demandera aussi d'empêcher telle ou telle action adverse, de limiter l'étendue ou l'intensité des conflits, voire éventuellement de paralyser toute action adverse à une action amie." La dissuasion a un "rôle protéiforme... depuis l'intention la plus défensive jusqu'à son influence au profit d'actions fondamentalement offensives...." André Beaufre, *Dissuasion et Stratégie* (Paris: Armand Colin, 1964), p. 20. The translation is the SAIC author's.

³⁸ Several crises unfolded during this decade, including, first, the establishment of the Organisation de l'Armée Secrète (OAS) – a French right-wing terrorist group formed in 1961 in opposition to potential Algerian independence – which conducted numerous terrorist attacks including an attempted assassination of de Gaulle in 1962; and later, in 1968, the military-staged Algerian coup d'état.

³⁹ The original French speech stated, "Dans la situation géographique et politique qui est celle de la France, [la dissuasion] est la meilleure garantie face aux menaces nées de la prolifération, quel qu'en soit le vecteur." Jacques Chirac, speech given at the closing of the 53rd session of the Institut des Hautes Études de Défense Nationale (IHEDN), 8 June 2001, available on the French MoD site:

justification for a French deterrent doctrine and the considerations for the French deterrent posture. The actual terminology of "deterrence of the strong by the weak" has largely disappeared from public discourse. The concept was last discussed explicitly by President François Mitterrand in 1988, and was omitted from the 1994 Defense White Paper.

There are three main rationales for French deterrence today:

- To deter major powers and proliferating powers from threatening French survival, and, specifically, to defend French "vital interests";
- To provide France with a continued independent capability and freedom of action; and
- To contribute to European security overall.⁴⁰

On the last point, there has been quite a bit of discussion in France about the possibility of a European deterrent and a common European nuclear policy, but discussions within the European Union have never truly progressed. France remains reluctant to share the task of decisionmaking related to its nuclear deterrent. However, successive presidencies have continued to embrace de Gaulle's concept of an extended European security guarantee provided by the French deterrent. In a speech in 1976, President Valéry Giscard d'Estaing referred to an "enlarged sanctuary".⁴¹ In 1992, President François Mitterrand proposed "studying the basis for a European nuclear doctrine", and one of his advisors coined the term "concerted deterrence".⁴² Prime Minister Alain Juppé reprised the concept in 1995, but his proposal was widely (and perhaps unfairly) dismissed as disingenuous as it coincided with the resumption of French nuclear testing. The current leadership has continued to stress France's commitment to "contributing to European security" specifically through the existence of its nuclear deterrent.⁴³ France has pursued independent discussions at different times with the United Kingdom and Germany, but again, these have never produced any clear plans for future collaboration.⁴⁴

The evolution of French force posture has been consistent with French doctrine and strategy since the 1950s, once again dictated by the "strategy of means" outlined previously.⁴⁵

http://www.defense.gouv.fr/actualites/discours_pr/080601.htm.

⁴⁰ Jacques Chirac, speech given on 8 June 2001, *op.cit.* The same rationales and imperatives were cited by French nuclear experts both at the DTRA/IISS Workshop, November 2002, and in private interviews by the author in Paris.

⁴¹ The original French text reads, "une sanctuarisation élargie". The translation is the SAIC author's. Giscard's speech is cited in Coutau-Bégarie, Hervé. "La Politique de Défense de la France," *Revue Stratégique*, No. 53, 1992.

⁴² Pascal Boniface, "French Nuclear Strategy and European Deterrence: 'Les rendez-vous manqués'", *Contemporary Security Policy*, Vol. 17, No. 2, August 1996, p. 229, as quoted by Burkard Schmitt in "L'Europe et la Dissuasion Nucléaire", European Union Institute for Security Studies Occasional Paper No. 3, October 1997 (<http://www.iss-eu.org/occasion/occ03.html>). For an excellent bibliography of modern expert writings on concerted deterrence, see Camille Grand, "French Nuclear Policy After the Cold War: How to Combine Deterrence and Arms Control," *Strategic Analysis*, Vol. XXII, No. 4, July 1998.

⁴³ In his landmark speech on 8 June 2001 (*op.cit.*), President Jacques Chirac stated, "Notre dissuasion nucléaire doit aussi, c'est le vœu de la France, contribuer à la sécurité de l'Europe." ("Our nuclear deterrent must also – it is France's wish – contribute to European security.") The translation is the SAIC author's.

⁴⁴ For an excellent overview of the debate concerning the European Union and specifically of discussions with and about Germany (based entirely on primary texts), see Loïck Benoit, "François Mitterrand et la Défense Nucléaire de l'Europe", *op.cit.* While the focus is on the Mitterrand years, a historical overview is provided as well.

⁴⁵ For an interesting and comprehensive overview of French armed forces in the 1950s and early 1960s as the *force de frappe* was taking shape, see the publication of the French Embassy in New York, *France and Its Armed Forces*

The actual *force de frappe* was not operational until the mid-1960s, and initially consisted only of airborne assets – four squadrons of Mirage IV aircraft equipped with ballistic missiles. Penetrating the Warsaw Pact air defenses was a daunting potential challenge for this arsenal, and the French began gradually turning to ballistic missile submarines ("sous-marins nucléaires lanceurs d'engins", or SNLE) – with production beginning in 1964 and *Le Redoutable* becoming operational in 1972 – and, later, nuclear attack submarines ("sous-marins nucléaires d'attaque", or SNA), the first of which, *Le Rubis*, became operational in 1981. This sea-based capability, by extending the reach of France's deterrent and improving its survivability, was designed to bolster its credibility.⁴⁶ France's land-based ground-to-ground ballistic missile capability was deployed at the Plateau d'Albion site in 1971. It rounded out the French force posture and gave it a flexible and diversified triad to support its "omnidirectional" doctrine. As French nuclear expert Bruno Tertrais has pointed out, however, the French force did not reach the "sufficiency" deemed necessary to give it maximum credibility until 1980, which marked the end of the growth of the *force de frappe*. From that point on, arsenals were only reduced, not expanded, to match French doctrine and strategy.⁴⁷

The French deterrent continues to be purely defensive; the French reject the notion of nuclear warfighting. They believe, as they did during the Cold War, that the American predilection for preemptive strategies undermines both deterrence and nonproliferation goals. France still maintains its forces at levels of strict sufficiency, and again, has frequently cast this position in contrast to American and Soviet (and later Russian) doctrine. Prime Minister Pierre Mauroy summed up this position succinctly in a 1983 speech: "Indeed the French nuclear deterrent forces have been limited to the minimum strictly necessary to ensure our deterrent's credibility. Our arsenal is therefore in no way comparable with those of the United States and the Soviet Union, which, for their part, have a nuclear overkill capacity."⁴⁸ Consistent with the emphasis of the political (vs. strategic or tactical) value of the French nuclear deterrent, French leadership has occasionally been willing to sacrifice technical research and development in the nuclear domain in order to maintain a reduced defense budget.⁴⁹ The practice of maintaining forces at levels of strict sufficiency has continued into recent years; in February, 1996, Jacques Chirac confirmed the elimination of the ground-based component of France's nuclear triad at the Plateau d'Albion, in effect shifting France's force posture to an air- and sea-based diad. In his words, "Our two submarine and airborne components are now sufficient to guarantee our

(December 1964). This booklet also provides an excellent summary of the first French Military Program Law (1960-64).

⁴⁶ Author's interview with two French nuclear experts, Paris, November 2002. A French nuclear expert currently with the French Ministry of Defense noted that the addition of *submarines* to the French nuclear arsenal was particularly powerful in providing credibility to the deterrent.

⁴⁷ See Bruno Tertrais, "La Dissuasion Nucléaire Française Après La Guerre Froide: Continuité, Ruptures, Interrogations" in the *Annuaire Français de Relations Internationales*, Vol. 1 (Brussels: Bruylants, 2000), translated as "French Nuclear Deterrence in the Aftermath of the Cold War: Continuity, Policy Shifts and Questions".

⁴⁸ Pierre Mauroy, "La Stratégie de la France," *Défense Nationale*, November 1983. The translated citation is provided in Robbin F. Laird, *France, the Soviet Union, and the Nuclear Weapons Issue* (Boulder: Westview Press, 1985), p.19.

⁴⁹ François Mitterrand reportedly refused to invest in advanced R&D to adapt French nuclear technology (in particular in the realm of warheads) to more modern military standards. Author's interview with a French nuclear expert (formerly an advisor to the Mitterrand government), Paris, 26 November 2002.

security.⁵⁰ In light of progressive cuts in French defense budgets, this posture also remains in line with the original French strategy of means.

French nuclear experts also point out that with the increased focus on regional adversaries (vs. a "great power" adversary), numbers of weapons "don't matter" for France, which currently ranks fourth among the nuclear-weapon states (NWS), behind China and ahead of the United Kingdom. When France was first evolving its nuclear posture, numbers mattered only inasmuch as they satisfied a minimum required to guarantee a retaliatory capability that would inflict the "unacceptable" damage described previously.⁵¹ In Général Gallois' early writings on the logic of proliferation, he noted that once a country had used nuclear weapons once, it was naked relative to other nuclear powers. A "day after" scenario was equated with an "end of the world" scenario.⁵² Today, a country can continue to find itself in a deterrent situation even after the use of nuclear weapons; for example, France could still deter a regional power even if it came into conflict with a major power. Even if France is the nation with the lesser arsenal, it still has a sufficient number of weapons to dissuade an adversary with, for example, WMD capabilities.

In spite of the recent reductions in the French nuclear arsenal and the dismantling of all ground-based forces in 1996, France plans to maintain an air-based and sea-based diad, rather than scaling down to a single delivery system. According to French nuclear experts, part of the rationale in maintaining a diad flows from the doctrine of flexible targeting and the need to extend the reach of the "ultimate warning". In 1986, Jacques Chirac stated that France's warning must be "issued in depth and across space".⁵³ Air-based forces can only be used in a "substrategic" role, in large part because the variety of warheads available in the French arsenal is very limited – therefore a sea-based force is necessary to provide strategic credibility. An explicitly stated mission of the French aircraft carrier Charles de Gaulle is to "support French nuclear deterrent strategy through its ability to deliver an "ultimate warning" strike on both naval and land-based targets."⁵⁴ At the same time, air-based forces provide a much greater degree of flexibility than a submarine force alone and enable this ultimate warning capability.⁵⁵ President Jacques Chirac summarized all of these factors in his landmark speech of June, 2001: "I have defined a program plan for our nuclear assets that will guarantee that France has at its disposal an aggregate force that is sufficiently diversified so as to guarantee the credibility of our deterrence under any circumstances, and irrespective of the specific origin or nature of the threat."⁵⁶

⁵⁰ Citation from Jacques Chirac's televised address of 22 February 1996, as translated by Pascal Boniface in "The Future of the French Nuclear Force Posture," *Strategic Analysis*, Vol. XXIII, No. 8, November 1999.

⁵¹ Commentary provided by several French nuclear experts, DTRA/IISS Workshop, November 2002.

⁵² Gallois, *Stratégie de l'Age Nucléaire*, *op.cit.*

⁵³ "Un ultime avertissement délivré dans l'espace et dans la profondeur." The speech was not found in open sources, but the citation was provided in the Author's interview with the French nuclear expert who coauthored this speech for Chirac in 1986 (the interview took place in Paris on 26 November 2002).

⁵⁴ The original text reads, "[Le porte-avions Charles de Gaulle] participe aussi à la stratégie de dissuasion nucléaire par sa capacité à délivrer une frappe d'ultime avertissement sur des objectifs navals ou terrestres." The translation is the SAIC author's. *Projet de loi de finances pour 2000*, (Senate Bill on National Budget for 2000), Vol. VIII – Defense – Naval Forces, adopted on 25 November 1999, available on the French Senate site, <http://www.senat.fr/rap/a99-0928/a99-09289.html>.

⁵⁵ Author's interviews with French nuclear experts, Paris, November 2002.

⁵⁶ The original text reads, "...j'ai défini une programmation de nos moyens nucléaires garantissant à la France de disposer d'un ensemble suffisamment diversifié pour assurer la crédibilité de notre dissuasion en toutes

Another argument in favor of a diad is survivability. A diad provides a form of redundancy (or insurance) in the case one delivery system is somehow annihilated – for example, if future improvements in foreign sonar capabilities cause the French submarine fleet to be destroyed. As it is kept at levels of strict sufficiency, the diad remains consistent with the French "strategy of means"; its maintenance and upgrades are affordable and sustainable even in the face of current defense budget constraints. The investment continues to be considered worthwhile by French leaders and government officials in light of the strategic advantage that a diad conveys.⁵⁷

III. Target Selection

French targeting doctrine has been both consistent and clear since the 1960s. In French nuclear doctrine, the value of a target stemmed from the unacceptable nature of its loss. As noted above, a central assumption in the formulation of French doctrine was that the Soviet Union would neither invade nor strike France as long as France could demonstrate to Moscow that it could do at least as much damage to the USSR as France was worth to Moscow as a "prize".⁵⁸ Targets were selected because their destruction would cause damage to the enemy's "economy, society, and infrastructure".⁵⁹ At the same time, "unacceptable damage" generally connoted very large numbers of casualties. The French population numbered roughly 45 million in the 1960s; thus, for example, the ability to kill 45 million Soviets could be considered a benchmark in French targeting decisions.⁶⁰ Valéry Giscard d'Estaing's presidential guidance for targeting in the 1970s invoked the ability to destroy 40-50% of the Soviet industrial base in the European half of the USSR (from Western Europe to the Urals).⁶¹ French governments continued to invoke the notion of "damage 'judged superior' to the demographic and economic potential that we represent" as a basis for targeting throughout the Cold War.⁶²

These criteria are articulated quite clearly in the early literature, and suggest that the "force de frappe" was viewed as providing an effective and sufficient deterrent from the outset. French expert François Géré, in his analysis of the early debate between the members of the élite French military cadre that formulated the core French nuclear doctrine, notes that "one critical problem remained: *at what or whom should our fearsome capability be targeted?* The debate is a familiar one: counterforce or countervalue?" He highlights the remarkable consensus between Gallois, Ailleret, Beaufre, and Poirier on this issue, namely, that the core targeting strategy should be "without question the capability to retaliate against what Gallois sometimes referred to as the adversary's 'vital works' and Poirier as '*their very essence*'." Géré concludes, as de Gaulle

circonstances et quelles que soient la localisation ou la nature de la menace." Jacques Chirac, speech given on 8 June 2001, *op.cit.*

⁵⁷ Interview with French nuclear expert, Ministry of Defense, Paris, 27 November 2002. The expert noted also that France is the only nation today to carry nuclear weapons aboard an aircraft carrier.

⁵⁸ French nuclear expert, DTRA/IISS Workshop, November 2002.

⁵⁹ These criteria are stated variously in the early literature, and were cited by several French nuclear experts both at the DTRA/IISS Workshop and in the Author's interviews, November 2002.

⁶⁰ As noted in the literature and by several French nuclear experts, the "size of France" was often the basic criteria in evaluating the scale of potential damage to enemy assets.

⁶¹ French nuclear expert, DTRA/IISS Workshop, November 2002.

⁶² The quotation is from former French Prime Minister Pierre Mauroy (government of President François Mitterrand), as cited by David Yost, "French Nuclear Targeting" in Desmond Ball and Jeffrey Richelson, Eds., *Strategic Nuclear Targeting* (Ithaca: Cornell University Press, 1986).

and the future generals did, that a "counter-city" strategy was the obvious choice for a weaker nation whose limited capabilities required an approach that threatened to cause "the greatest possible harm that could be inflicted."⁶³

In practice, with the sole exception of the potential "prestrategic" use of tactical nuclear weapons, French targeting objectives have indeed consistently been counter-value ("counter-city"), not counter-force.⁶⁴ The initial target base consisted entirely of Soviet cities not only because that was where the threat to French vital interests was perceived to emanate from, but also because, as suggested previously, this was the most cost-effective approach for France, a country with a limited arsenal and a limited budget. Again, a "strategy of means" drove many important tactical decisions. In terms of issuing an "ultimate warning" with an inherently counter-force quality, French experts have cited nuclear air bases in Poland and Soviet forces in East Germany as examples of prestrategic targets.⁶⁵ The notion was to cripple Soviet defense systems in anticipation of a broader Soviet conflict with the United States. In later years, even before the fall of the Berlin Wall and the unification of Germany, François Mitterrand went out of his way to clarify that the "ultimate warning" no longer applied to any part of East Germany – which confirmed that German targets had been designated by France in the past. Mitterrand stated that the objective of French nuclear strategy was simply to reach the soil of the attacking country directly – and that, in 1987, East Germany was not considered a potential attacker.⁶⁶

According to French nuclear experts, French strategic thinkers also came to perceive counter-force postures as one of the main drivers of arms races. Thus the counter-force doctrines embraced by the United States and the Soviet Union led them to a very specific kind of arms race, and one where nuclear targets took precedence over conventional military targets.⁶⁷ By contrast, for France, a counter-force approach was simply not sustainable at low levels of nuclear weapons. In addition, as discussed previously, France rejected the notion of nuclear warfighting and did not view nuclear war as an extension of conventional warfare; thus the concept of a

⁶³ The three sets of quotations in this paragraph are the SAIC author's translations from François Géré, *op. cit.* The emphasis in italics appears in Géré's original text. The full French citation reads, "Reste un dernier problème, essentiel : *Sur quoi faire porter la menace ?* Le débat est bien connu: anti-forces ou anticités? On doit constater ici la remarquable convergence des quatre stratégies pour qui, compte tenu de la position française, il ne saurait être question d'autre chose que d'une capacité de représailles contre ce que Gallois nomme parfois les '*œuvres vives*' et Poirier la '*substance même*' de l'adversaire. La position du faible dont les capacités sont limitées conduit nécessairement à cette conclusion. Mais peut-il en exister d'autres? Y-a-t-il un sens à ce ciblage anti-forces à coup de milliers de charges nucléaires, s'il s'agit de dissuader? Et compte tenu de la localisation des 'forces' significatives de l'adversaire, que signifieraient en termes de coût humain les frappes anti-forces? Quoiqu'il en soit, celui qui ne dispose que de moyens réduits recherche nécessairement, dans une stratégie en mode virtuel, à brandir la menace du plus grand mal possible qu'il peut infliger."

⁶⁴ According to French nuclear experts, historically, even a French "prestrategic" use of nuclear weapons would not inherently have been counterforce – or at the very least, it would have been "a different kind of counterforce", still primarily focused on inflicting a level of damage that represented a precise and unacceptable economic and strategic value to the enemy. French nuclear experts, DTRA/IISS Workshop, November 2002.

⁶⁵ Interview with French nuclear expert, Paris, 26 November 2002.

⁶⁶ Loïck Benoit, "François Mitterrand et la Défense Nucléaire de l'Europe", *op.cit.* Several important speeches by Mitterrand are cited in this article, including the 21 October 1987 speech clarifying that Germany was not a target.

⁶⁷ French nuclear expert, DTRA/IISS Workshop, November 2002.

counter-force attack – which suggests "the idea of nuclear combat, not just *dissuasion*" – is fundamentally incompatible with the purely defensive French nuclear doctrine of deterrence.⁶⁸

Today, discussion of targeting focuses on maintaining flexibility; the doctrine of "défense tous azimuts" (omnidirectional defense) has increased in relevance. Public opinion and popular sentiment are factored into the decisionmaking on French targeting, and the result is a greater selectivity and discrimination in target selection that seeks to avoid mass casualties (to the extent that this is realistic in any given scenario). Specific targets are not publicly discussed. "Counter-city" was deliberately omitted from the 1994 French Defense White Paper because of this new emphasis. The weapons in the current French arsenal are designed to provide flexibility, precision, and controlled effects. In 2001, during the French equivalent of the "Nuclear Posture Review", Chirac was more explicit about targeting because it was important to him to clarify the meaning of deterrence. He reiterated the problems with advocating a counter-city approach in the modern international context, and suggested that the focus of targeting should instead be on political, military, and economic "centers of power".⁶⁹ In line with Général Beaufre's early musings on the stability of deterrence (discussed below in Section 5), Chirac also emphasized that France would maintain the capability to retaliate. He also reaffirmed the core French nuclear doctrinal tenet that nuclear weapons were not to be considered as an option in a conventional military campaign.⁷⁰

An important and interesting facet of French counter-city posture is that France "does not apologize for targeting civilians", because the corollary effect of civilian casualties is a necessary component of credible deterrence.⁷¹ As noted above, a core element of French doctrine is that this approach is considered more conservative than and preferable to all-out nuclear war. In the French view, the mere policy of targeting is legitimized by Article 51 of the United Nations Charter, as deterrence is part and parcel of "the inherent right of individual or collective self-defense".⁷² For France, the important focus is not *what* you target, but how you justify that targeting. As Chirac noted in 2001, the core of French deterrence remains the ability to inflict unacceptable damage to any country threatening French vital interests *under any circumstances*.

French nuclear experts caution that in the more recent debate, there is some ambiguity in the French notion of "sufficiency" in correlating force posture with targeting objectives. When discussing a single adversary, the notion of damage was evaluative and relatively straightforward. The targeting rationale could be linked to a threat that was measurable. Today, "unacceptable damage" is not a sufficient rationale. If multiple adversaries are considered to

⁶⁸ Pascal Boniface, "French Nuclear Weapons Policy After the Cold War," *Atlantic Council Occasional Paper*, August 1998.

⁶⁹ The original French citation reads, "Les dommages auxquels s'exposerait un éventuel agresseur s'exerceraient en priorité sur ses centres de pouvoir, politique, économique et militaire." Jacques Chirac, speech given on 8 June 2001, *op.cit.* A very similar concept of targeting "sources of Soviet state power" was publicly articulated by the British in 1958.

⁷⁰ Jacques Chirac, speech given on 8 June 2001, *op.cit.*

⁷¹ French nuclear expert, DTRA/IISS Workshop, November 2002.

⁷² *Charter of the United Nations* (San Francisco, signed 26 June 1945, effective 24 October 1945), Chapter VII, Article 51. <http://www.un.org/aboutun/charter/index.html>

pose a threat, then the evaluation is of "two or three at a time"; the notion of sufficiency takes into account intentions as well as capabilities and becomes a complex evaluation in this regard.⁷³

It should be noted that in 1996, all French nuclear weapons were officially detargeted; in 2001, Jacques Chirac confirmed that the French nuclear arsenal was not aimed at any specific country.⁷⁴ That said, the public literature suggests current or recent potential targets both in the "East" and the "South", and countries such as Iran, Iraq, Libya, and Algeria are named privately by government officials and French nuclear experts.⁷⁵ A French nuclear expert who had worked at the CEA in the 1980s suggested that there were discussions with François Mitterrand concerning variable warheads for submarines at different ranges; one of the targets discussed in this context, not surprisingly, was Libya and specifically, the assets of Colonel Gaddafi.⁷⁶ In a speech in October 1999, then Prime Minister Lionel Jospin suggested that Asia ("a geographically distant threat") should be considered a target area if countries in the region should choose to blackmail France or to somehow threaten France's vital interests.⁷⁷ He reprised this statement in a similar speech in September, 2000.⁷⁸ In both cases, the speeches referred to countries with emergent ballistic missile capabilities. According to most French nuclear experts, the implied target of these remarks was China, although public speculation also focused on Pakistan.⁷⁹ French nuclear experts caution, however, that the reach of the French deterrent is still not fully global; even today, France's nuclear submarines would have difficulty reaching China in a timeframe that could be considered strategically viable.⁸⁰

IV. Communication of the Deterrent by the French

From the French perspective, a deterrent force can only be effective if its potential consequences are clearly communicated. However, this communication is both explicit and implicit. Public statements generally have provided a first step in warning a potential adversary against an attack on – or even an overt threat to – French vital interests, but they have almost always been backed with unambiguous private discourse. In addition, French nuclear experts concur with the early literature's claims that words alone are insufficient. A deterrent is only

⁷³ French nuclear expert, DTRA/IISS Workshop, November 2002.

⁷⁴ Jacques Chirac, speech given on 8 June 2001, *op.cit.*

⁷⁵ Private interviews conducted by American nuclear expert David Yost in Paris, April 1993, summarized in "Nuclear Weapons Issues in France", *op.cit.*; Author's interviews in Paris, November 2002.

⁷⁶ Author's interview with French nuclear expert, Paris, 26 November 2002.

⁷⁷ The full context of this statement lies in the following citation: "Dans le contexte stratégique actuel, contrasté et mouvant, marqué par l'apparition de nouveaux risques, la dissuasion nucléaire repose sur des capacités autonomes, permettant de contrer la matérialisation d'une menace contre nos intérêts vitaux, quelles qu'en soient l'origine – même lointaine – la nature ou la forme." ("In the current complex and unstable strategic context, marked by the emergence of new risks, nuclear deterrence is based on autonomous capabilities that allow us to counter the advent of a threat against our vital interests, whatever the source – even a distant one – its nature or its form.") This translation is the SAIC author's. Lionel Jospin, "Allocution à l'Institut des Hautes Études de Défense Nationale" (Paris, October 22nd, 1999).

⁷⁸ The citation in this speech reads, "dissuader toute menace, même lointaine" ("to deter any threat, even geographically remote"). The translation is the SAIC author's. Lionel Jospin, "Allocution lors de l'ouverture de la session annuelle de l'Institut des Hautes Études de Défense Nationale" (Paris, September 22nd, 2000).

⁷⁹ See, for example, an editorial by Ignacio Ramonet in *Le Monde Diplomatique*, November 1999 issue (p.1), entitled "La Menace Pakistan".

⁸⁰ Interview with French nuclear expert, Paris, 26 November 2002.

credible if it is backed by obvious political and technical capability.⁸¹ In this context, several of the French nuclear experts interviewed pointed to France's very open nuclear testing – particularly in the early years under de Gaulle – as a clear example of signaling not just to potential adversaries, but also to allies. As noted in a recent Western European Union report, the success of France's first atmospheric test, conducted in Algeria on 13 February 1960 and code named *Gerboise Bleue*, "informed the world that France was joining the very restricted nuclear power club."⁸² Many of France's subsequent tests throughout successive presidencies continued to serve this public communication purpose, until the final cessation of French tests in 1996.

The gradual development of French force posture also was intended to signal both France's capabilities and the resolve to use nuclear weapons. This development began with the mass production of Mirage IV bombers under de Gaulle, configured to carry ballistic missiles. As noted previously, the French addition of a naval (submarine) capability in the late 1960s and early 1970s, and the current maintenance of a nuclear triad, both are believed to lend strong credibility to the French nuclear deterrent, even at increasingly low levels of nuclear weapons. The land-based capability at the Plateau d'Albion (dismantled in 1996) was always presumed by the French to be a target; to ensure communication of this deterrent as a *carefully protected* asset, particularly in the 1980s, signaling was once again used in the form of France's tactical nuclear weapons capability that would provide the "ultimate warning" discussed previously.⁸³ That being said, the relationship between French force posture and French doctrine has perhaps not always been as clear-cut as French strategists intended. The technical implementation of Général Ailleret's desire for an "omnidirectional" capability with a global reach never fully took shape, and it is not clear that the ballistic submarine fleet was ever sufficiently large as to be truly ominous to an adversary.

Bolstering the effects of nuclear signaling, and foremost in the implicit communication of deterrence, is political leadership. As noted in Section 1, one of the preconditions for "la dissuasion du faible au fort" (deterrence of the strong by the weak) was the willingness of the French President to use nuclear weapons. De Gaulle was unambiguously comfortable with the notion. He went so far as to occasionally joke with his generals, "have you used your nuclear weapons today?" (to which they would reply, "they are not mine, sir, they are yours").⁸⁴ Successive presidents have echoed this willingness very publicly, emboldened perhaps by the inherent power bestowed upon them by this unique authority and responsibility. Valéry Giscard d'Estaing commented that "the decision to put our means of deterrence into play rests with only one person," François Mitterrand suggested that "the core element of deterrence strategy is me,"⁸⁵ and Jacques Chirac recently referred to himself as the "ultimate guardian of deterrence and sole decisionmaker concerning the possible use of our nuclear force."⁸⁶

⁸¹ On the technical front, there is some disagreement as to whether the current French deterrent is truly viable in this regard. A former French nuclear submarine commander suggested to us, for example, that in terms of sheer numbers of submarines, the French force is not credible. DTRA/IISS Workshop, November 2002.

⁸² "Resumption of French Nuclear Tests in the Pacific" (Paris: Western European Union Assembly, Document 1488, 7th November 1995)

⁸³ Interview with French nuclear expert, Paris, 26 November 2002.

⁸⁴ Anecdote told by a French nuclear expert, DTRA/IISS Workshop, November 2002.

⁸⁵ Respectively, "L'utilisation des moyens de dissuasion ne peut reposer que sur la décision d'un seul" (Valéry Giscard d'Estaing) and "la pièce maîtresse de la stratégie de dissuasion, c'est moi" (François Mitterrand). Bernard Chantebout, *L'Organisation Générale de la Défense Nationale en France Depuis la Fin de la Seconde Guerre*

Convincing leadership, along with the *perception* of strong leadership, have been important not only with respect to communicating France's nuclear deterrent to potential adversaries, but also in terms of garnering domestic support for France's nuclear deterrence doctrine and the associated force posture and counter-city targeting policy. At a critical and very transitional time in French history, de Gaulle embodied the hope for a strong, independent, and secure France; his nuclear program was accepted as part and parcel of that hope (indeed proving his point that weapons have as much political as strategic value). Strong leadership resolve in subsequent presidencies has contributed to keeping the level of antinuclear sentiment in France much lower than, for example, in the United Kingdom.⁸⁷ Manipulating public perceptions on a leader's resolve to use nuclear weapons has also occasionally been used as a campaigning tool in French politics. When President Valéry Giscard d'Estaing was running against his former Prime Minister Jacques Chirac in the late-1970s, Chirac openly suggested that Giscard "might not have the guts to push the button" – whereas he, Chirac, *did* have the courage to do so.⁸⁸

According to French nuclear experts, there was considerable ambiguity in the early French public discourse and in the writings of French public officials on targeting – i.e., whether it was populations or cities that were being targeted. This ambiguity arguably was deliberate, as the need to balance opacity with transparency was considered critical to a successful communication of the deterrent.⁸⁹ At the same time, in light of French threat perceptions, the evident counterargument to any ambiguity in French targeting was "if not cities, then what?"⁹⁰ Most Soviet assets were in cities – they were the obvious targets. A more general analysis of targeting at low levels of nuclear weapons suggests that national capitals would inherently be on a nuclear weapon state's list of targets – although the French literature does not focus specifically on "decapitation". As noted in Section 1, a very interesting facet of the French public communication of deterrence was that the USSR and Moscow were not named explicitly as targets until the late 1970s – a noteworthy change in French communication strategy.

The importance of ambiguity in French public discourse persists today. One lesson that can be learned from the French experience, however, is that too much vagueness can cause the message to go unnoticed. When, in his widely-broadcast speech of October 1999, Lionel Jospin referred to the French deterrent as being effective against a "geographically distant" threat, the unspoken implication was that the French deterrent could be targeted at China. However, French

Mondiale (Thesis, Paris, Librairie Générale de Droit et de Jurisprudence, 1966, p. 441) as cited in David Cumin, *L'Arme Nucléaire Française Devant le Droit International et le Droit Constitutionnel* (Occasional Report, Groupe d'Étude sur le Nucléaire et les Relations Internationales et Stratégiques, September 2000) <http://generisfrance.free.fr/anucasp/cumin00.html>

⁸⁶ The French statement reads, "ultime gardien de la dissuasion et décideur unique de la mise en oeuvre éventuelle de nos forces nucléaires." Jacques Chirac, speech given on 8 June 2001, *op.cit.*

⁸⁷ While nuclear weapons are occasionally portrayed in the literature and in French political discourse as "armes de non-emploi" (weapons that will never be used) – suggesting that deterrence will not fail and that consequently there will never be a need to use nuclear weapons – the concept is largely rejected by French nuclear experts, particularly by military analysts, in light of the general willingness of successive governments to employ nuclear weapons in defense of French vital interests. A note on semantics: the term "non-emploi" (non-use) is frequently used by French policymakers to refer to France's "no first use" policy. In this context, it obviously has a nuanced meaning.

⁸⁸ French nuclear expert, DTRA/IISS Workshop, November 2002.

⁸⁹ François Géré, *op.cit.* This view was also echoed in the author's interviews with French nuclear experts.

⁹⁰ French nuclear expert, DTRA/IISS Workshop, November 2002.

nuclear experts pointed out that the true meaning of Jospin's vague phraseology was "comprehensible only to theologians", and that any intended audience in Asia probably did not get the message.⁹¹ As discussed above, it also led to a considerable amount of public speculation over his intended meaning, leading respected news publications as well as prominent academics to publicly suggest other potential targets.

Not surprisingly, there is very little in the public literature about private communications of the French deterrent. When asked for examples of instances when private communications were required to bolster public statements, a British nuclear expert related an episode that took place during the Berlin crisis of 1961, and that demonstrates the French commitment to the "ultimate warning" scenario. When the Russian Ambassador to France questioned Charles de Gaulle's determination to use nuclear weapons in the face of a possible return strike, the General reportedly replied, "So, Mr. Ambassador – we will die together."⁹² The French nuclear experts interviewed for this project generally admitted that the subject of private communications was too sensitive to discuss. The experts did comment, however, that in contrast to public communications of the French nuclear deterrent, explicit detail and careful word choice were critical when communicating deterrence privately; the vocabulary would inherently be different. One expert pointed to a recent example in the United States as illustrative, namely, the public reference to "reductions" in the United States arsenal in the Nuclear Posture Review (NPR), when the true meaning was more of an adaptation to new targeting requirements (discussed privately).⁹³ Most of the experts concurred that ambiguity, which must be employed judiciously even in open communications to avoid nefarious misinterpretation, can be particularly counterproductive in private communications and should be avoided unless the power of mere suggestion provides a clear diplomatic gain.

V. France's Perspective on Crisis Stability of Deterrence at Low Levels of Nuclear Weapons

With respect to the crisis stability of deterrence, and the contribution of nuclear deterrence to stability in international affairs, the French perspective has again been remarkably consistent from the origins of the French nuclear program through the present day. Two fundamental principles emerge from French writings on stability across the years: first, that nuclear deterrence is critical to guaranteeing international stability; and second, that *only* low levels of nuclear weapons can guarantee stability – anything greater than a minimum deterrent is perceived by the French to be inherently destabilizing.

In the early years, Général Beaufre appears to have been the original thinker who focused most rigorously on the issue of stability and guided the evolution of French strategic thinking in that domain.⁹⁴ His main thesis was that the ability to retaliate was critical: "An evaluation of nuclear stability depends on the outcome of a debate over second strikes, i.e., on a comparison of

⁹¹ French nuclear expert, DTRA/IISS Workshop, November 2002.

⁹² British nuclear expert, DTRA/IISS Workshop, November 2002. This story also is narrated in greater detail by French Rear Admiral Yves Naquet-Radiguet in an article published in *Défense Nationale*, May 2002, pp.28-33.

⁹³ French nuclear expert, DTRA/IISS Workshop, November 2002.

⁹⁴ François Géré, *op. cit.*

the effectiveness of each adversary's capacity for counterattack.⁹⁵ Thus, in order to have a credible deterrent capability, a country must invest in a sufficient force posture. "Unstable situations arise only if the odds of retaliation are nonexistent or very low. As soon as the risk of retaliation is evident, stability is more or less absolute." Beaufre also referred to this concept as "relative stability".⁹⁶ In a more general context, and echoing de Gaulle's perspectives on the nature and extent of French vital interests, Général Gallois argued that a French nuclear force would contribute to international stability by providing a disincentive for other nuclear powers to use their weapons.⁹⁷

The literature surveyed in this project did not generally include in-depth analyses of stability in the specific context of France; most writings cast stability in a broader global context. François Géré points out that Général Beaufre directed the Institut Français d'Études Stratégiques, which studied the stability of nuclear deterrence and the problems caused by escalation. Their conclusions, however, were more general and based on the concept of nuclear parity, and therefore not entirely applicable to France.⁹⁸ Similarly, much of the modern literature – including several excellent analyses on stability by French nuclear expert Camille Grand⁹⁹ – tends to provide the French perspective on the stability consequences of international nuclear proliferation or of American nuclear policies, rather than on the effects that low numbers and a strictly defensive doctrine can have on the crisis stability of deterrence. Interviews with French nuclear experts did consistently reflect the French view, however, that a deterrent posture is inherently a stabilizing element both in peacetime and in a crisis situation.¹⁰⁰ Jacques Chirac expressed this perspective succinctly in a recent speech: "Nuclear deterrence is first and foremost an important factor in international stability. It is thanks to nuclear deterrence that Europe has been spared, for more than fifty years, the devastation that it experienced during the 20th century. A credible nuclear threat compels peace by imposing restraint and encouraging common sense."¹⁰¹

As with other components of its nuclear doctrine and strategy, French discussions of stability tend to contrast its own minimal deterrence posture with that of the United States and Russia, arguing that arms races are inherently destabilizing. One French expert noted that "in

⁹⁵ The original French text reads, "L'évaluation de la stabilité nucléaire dépend de la dialectique des deuxièmes frappes, c'est-à-dire de la comparaison entre l'efficacité des ripostes des deux adversaires." The translation is the SAIC author's. Général Beaufre, *Dissuasion et Stratégie*, *op.cit.*

⁹⁶ The French text reads, "Les situations instables n'existent que si le risque de riposte est nul ou très faible. Dès que le risque de riposte cesse d'être faible, on se trouve dans ces situations de stabilité plus ou moins absolue." The translations are the SAIC author's. Beaufre, *Dissuasion et Stratégie*, *op.cit.*; this text also contains the reference to "stabilité relative" (relative stability).

⁹⁷ Gallois, *Stratégie de l'Age Nucléaire*, *op.cit.*

⁹⁸ François Géré, *op. cit.*

⁹⁹ See in particular Camille Grand, "Ballistic Missile Threats, Missile Defenses, Deterrence, and Strategic Stability" in William C. Potter and John Simpson, Eds., *International Perspectives on Missile Proliferation and Defenses* (Monterey Institute of International Studies, Center for Nonproliferation Studies, Occasional Paper No. 5, March 2001).

¹⁰⁰ Author's interview with a French nuclear expert, Paris, 26 November 2002.

¹⁰¹ The original French text reads, "La dissuasion nucléaire est d'abord un facteur important de la stabilité internationale. C'est à elle que l'Europe doit d'avoir été préservée, depuis plus de cinquante ans, des ravages qu'elle a connus au cours du XXème siècle. Imposant la retenue, incitant à la raison, la menace nucléaire crédible commande la paix." The translation is the SAIC author's. Jacques Chirac, speech given on 8 June 2001, *op.cit.*

order for deterrence to be truly credible, the deterrent cannot be used to achieve positive gains", implying that it must be purely defensive and retaliatory.¹⁰² Similarly, proliferation of any kind – particularly by "rogue" states developing WMD capabilities, even at low levels – is perceived by French leaders and strategists as undermining stability, both in peacetime and in crisis. Fanaticism or fundamentalism on the part of leaderships endowed with the responsibility for these new arsenals will be disruptive to any stable international order and to any defense calculus in a crisis situation.¹⁰³

¹⁰² Author's interview with a French nuclear expert, Paris, November 2002.

¹⁰³ British and French nuclear experts, DTRA/IISS Workshop, London, November 2002.

APPENDIX: FRANCE'S NUCLEAR FORCE POSTURE

The evolution of France's nuclear force posture is discussed in our main chapter on French Nuclear Deterrence. An excellent overview also is provided by Bruno Tertrais in his essay "French Nuclear Deterrence in the Aftermath of the Cold War: Continuity, Policy Shifts and Questions" (Brussels: Bruylant, 2000), with figures current through the year 2000. France's force posture in 2003 consists of a nuclear diad. Following the publication of the 1994 *French White Paper on National Defense*, France's ground-launched force of Hadès missiles was dismantled (1996); France's S3D IRBMs were deactivated (1996); the number of operational SSBNs was lowered to four; the Mirage-IVP bomber missions ceased; and French nuclear forces were de-alerted (a process begun in 1992). The rationale behind France's commitment to maintaining a nuclear airborne and sea-based diad is discussed in detail in the preceding chapter.

The following is a concise summary of France's force posture as it currently stands (predicated upon the French doctrine of strict sufficiency), and incorporates the most recent data from the recently ratified French *Military Plans and Programs* Bill for 2003-2008.¹⁰⁴

France currently has 45 Mirage 2000N bombers configured for a nuclear role. Each aircraft can carry one air-to-surface missile ("Air-Sol Moyenne Portée" or ASMP), which delivers a TN-81, 300-kiloton bomb over a standoff range of up to 160 nautical miles (300 km) and can reach speeds of Mach-2 to Mach-3. Roughly 100 of these missiles have been built, with roughly 80 available warheads. France also has 24 Super Étandard strike aircraft, each equipped with one ASMP missile. These are based on the *Charles de Gaulle*, France's only operational aircraft carrier.

France has two *Redoutable*-class ballistic missile submarines (SSBNs) still in service – *L'Indomptable* (Indomitable) and *L'Inflexible* (Unyielding). Each carries 16 M-4 A/B SLBMs. Each M-4 carries six 150 kt multiple independently-targeted reentry vehicle (MIRVed) TN-71 warheads with a range of 2,370-3,240 nautical miles (4,400-6,000 km), for a total of 192 TN-71 warheads. Two of the newer *Triomphant*-class submarines are currently in service: *Le Triomphant* (Triumphant) and *Le Téméraire* (Bold). Each carries 16 M-45 SLBMs with improved penetration aids. Each M-45 carries six 100 kt TN-75 MIRVed warheads (lighter than the TN-71s) with a range of 3,240 nautical miles (6,000 kilometers), for a total of 192 TN-75 warheads.¹⁰⁵

According to the Fact Sheet supplied by the Marine Nationale, the aircraft carrier *Charles de Gaulle*, when accompanied by its supply craft, can remain at sea almost indefinitely. No specific mention of speed of deployment of SSBNs and SLBM warheads in time of crisis was mentioned in the literature reviewed.

¹⁰⁴ *Programmation Militaire pour les Années 2003 à 2008*, Sénat, Session Ordinaire de 2002-2003, Projet de Loi Adopté par l'Assemblée Nationale, No. 84, December 4th, 2002.

¹⁰⁵ For further details on each of these SSBNs, including tonnage, radar, sonars, crew, etc., please view the Fact Sheets ("Fiches Techniques") on the French Navy Web site, <http://www.defense.gouv.fr/marine/index.html>. See also Pascal Boniface, "The Future of the French Nuclear Force Posture," *Strategic Analysis*, Vol. XXIII, No. 8, November 1999.

Looking to the future, a third *Triomphant*-class SSBN, *Le Vigilant* (Vigilant), has been fully assembled at the Direction de Constructions Navales (DCN) in Cherbourg and will be fully operational in 2004. Defense Minister Alain Richard signed a directive on 28 July 2000 to begin production of the fourth *Triomphant*-class SSBN, to be named *Le Terrible* (Fearsome, a name already used in a previous generation of submarines). This SSBN will be commissioned in 2008. This schedule is consistent with the capabilities of the current operational submarine fleet and with France's "strategy of means". Technical inspections of the new *Triomphant*-class SSBNs will take place at new facilities completed in Brest in the Spring of 2002.¹⁰⁶ The new French bill on Military Programs for 2003-2008 also plans for a new generation of nuclear attack submarines (sous-marins nucléaires d'attaque or SNAs), a project named *Barracuda*. This new generation of SNAs will gradually replace the current fleet of six *Améthyste* SNAs. It is anticipated that the first two SNAs built under *Barracuda* will be operational in 2012.¹⁰⁷

While the two new *Triomphant*-class SSBNs will initially carry 16 M-45 SLBMs, they will be retrofitted in 2010 with the new M-51 SLBM. The M-51 will be able to carry 12 MIRVed TN-76 warheads, but is more likely to carry 8. Its range will be close to 5,900 nautical miles (11,000 km).¹⁰⁸

ASMP missiles also are scheduled to be upgraded in 2008 to ASMP "Amélioré" ("improved"), known as ASMP-Plus, alternatively written as ASMP + or ASMP-A. These will have improved stealth features and almost double the range of the current ASMPs (to 500 km), while maintaining a comparable weight and size. Deployment of the ASMP + is anticipated on both the Mirage 2000Ns and Rafale strike fighters.¹⁰⁹ In the interim, the Rafales are also armed with the new "Scalp EG" cruise missile. The French Navy anticipates expanding its Rafale force to 60 aircraft by 2006.¹¹⁰

The French bill on Military Programs for 2003-2008 also plans for the construction of a second French aircraft carrier by 2015 (which would accommodate part of the new Rafale fleet), although the reality of this proposition is still being debated – including a possible collaboration with the United Kingdom. It is not yet clear whether this second aircraft carrier would have a nuclear propulsion system like the *Charles de Gaulle*, or a conventional propulsion system.¹¹¹

Lastly, the French ceased all nuclear testing in 1996. France is developing the PALEN program ("Préparation à la Limitation des Essais Nucléaires"), centered around a facility using computer simulation of nuclear testing to develop new warheads, in lieu of actual nuclear explosions. The

¹⁰⁶ Announcement by French Defense Minister Michèle Alliot-Marie, 31 July 2002, disseminated by News France, official communications site for French governmental institutions, http://www.newsfrance.org/affiche.asp?Doc_id=204800

¹⁰⁷ *Programmation Militaire pour les Années 2003 à 2008*, *op.cit.*

¹⁰⁸ Aldridge, Bob. "Nuclear Weapons Inventories of the Eight Known Nuclear Powers," *Pacific Life Research Center Paper #970508D*, revised 9 September 2000.

¹⁰⁹ "Missile Nucléaire ASMP-A" and "Le Rafale, Moins Cher et Plus Performant," *Air & Cosmos*, 22 November 2002.

¹¹⁰ "Les Crédits d'Équipement Militaire en Forte Hausse," *Le Monde*, September 5th, 2002

¹¹¹ *Programmation Militaire pour les Années 2003 à 2008*, *op.cit.* For the debate over the parameters of a new carrier, see "La France Renforce son Budget de Défense," *Le Monde*, September 11th, 2002.

French are also building a large laser-based program for fusion research, known as the "Laser Megajoule" (LMJ). This program was begun in 1992 under the auspices of the French Atomic Energy Commissariat's Military Applications Directorate. The French conducted a nuclear security exercise in February 2001 on the *Charles de Gaulle* aircraft carrier. According to the French Ministry of Defense, the French Navy regularly conducts such exercises to perfect their response in the event of an incident or accident within an on-board nuclear installation.¹¹²

¹¹² Information brief issued by the French Ministry of Defense – Information and Defense Communications Branch (Délégation à l'Information et à la communication de la Défense), Paris, 21 February 2001. http://www.newsfrance.org/affiche.asp?Doc_id=203334.

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THE PEOPLE'S REPUBLIC OF CHINA

Christine Cleary

Overview

The origins, evolution, and current construct of China's nuclear doctrine, strategy, and force posture remain in many ways unclear to U.S. analysts and planners. The intense secrecy surrounding China's nuclear program in addition to the centrality of opacity in Chinese strategic planning makes it difficult to gauge China's longer-term strategic objectives. Therefore, any judgments about Chinese nuclear thinking should be considered tentative. What is known of Chinese nuclear strategy is based mainly on China's articulated policies, supplemented by commentary of Chinese experts, and recent works by U.S. scholars that examine Chinese language materials.

China's nuclear strategy has coalesced as a result of numerous factors, most specifically its assumptions regarding perceived threats to its security environment. The translation of China's strategy into nuclear force posture has been mediated by political, economic, and technical considerations. China's nuclear posture is also bolstered by consideration of the military utility of nuclear weapons, recognition of resource limitations and competing interests of the leadership, and the belief that strategic ambiguity and concealment of actual numbers and precise locations of deployed weapons are necessary and presumably sufficient to guarantee the survivability of China's limited nuclear retaliatory force.¹

China's declared nuclear weapons policy, as expressed through official statements of the Chinese government and defense white papers, has remained relatively consistent. The declaratory principles, which articulate China's "defensive" nuclear doctrine include the "No First Use" (NFU) principle, which states "China undertakes not to be the first to use nuclear weapons at any time or under any circumstances." Also, China maintains its negative security assurances (NSAs), which promise no use or threatened use of nuclear weapons against non-nuclear weapons states or nuclear-weapons-free zones at any time or under any circumstances. China has also expressed its disapproval of other countries' "nuclear umbrellas" or the policy of extended deterrence, and to that end, has never deployed nuclear weapons on the territory of another country. Finally, China is a signatory to several nuclear weapons free zone (NWFZ) treaties or their protocols.²

While there is no concrete evidence that China intends to deviate from its stated nuclear principles, a few analysts have noted, "nothing in these principles necessarily precludes China's nuclear weapons modernization program, but might place political limits on targeting and use options."³ Indeed, China's nuclear forces continue to undergo strategic modernization.

¹ Phil Saunders and Jing-dong Yuan, "China's Strategic Force Modernization: Three Scenarios and their Implications for the United States," *Center for Nonproliferation Studies Paper*, p 8.

² *China's National Statement of Security Assurances*, 5 April 1995. Internet: <http://www.nti.org/db/china/engdocs/npt0495a.htm>.

³ Bates Gill, James Mulvenon, and Mark Stokes, "The Chinese Second Artillery Corp: Transition to Credible Deterrence," in James C. Mulvenon and Andrew N.D. Yang, eds., *The People's Liberation Army as an Organization*, Reference Volume 1, p 517. Internet: <http://www.rand.org/publications/CF/CF182/>

However, the direction and rate of modernization will likely be contingent on China's assessment of the changing strategic environment. Currently, the prospects of U.S. missile defense, the possibility of U.S./Russian collaboration on defenses, and the specter of a potential U.S.-China-Taiwan scenario all cause perturbations in the Chinese strategic environment. The changing strategic situation would likely further any Chinese reevaluation of its traditional strategic nuclear doctrine of minimum deterrence.

I. Origins and Early Development of Chinese Nuclear Strategy, Doctrine, and Force Posture

The central role of opacity in Chinese nuclear strategy, particularly about such issues as command and control, operational procedures, and targeting, has resulted in a relative dearth of open sources on these issues. This lack of information could cause analysts to interpret similar data regarding China's nuclear strategy in different ways.⁴ A variety of factors, particularly the Chinese leadership's threat perceptions and assessment of the international security environment, supplemented by numerous political, technical, and economic considerations, are identified in this chapter as the primary drivers behind the initial development and the evolution of Chinese nuclear weapons strategy, doctrine, and force posture.

A. Assumptions

The lessons of the Korean War were significant in shaping China's assumptions about the nature of warfare and the requirements for the county's security. The war introduced China to advanced armaments and techniques, and more importantly, to the threat of nuclear attack. As a result, the Chinese leadership recognized the need for technological modernization, specifically, that possession of the atomic bomb was vital to China's security.

Mao's China viewed the atom bomb as a symbol of national sovereignty, and by extension, as a testament of socialist resolve in the face of U.S. imperialism.

Mao had long regarded a country's independent capacity to display, deploy, and commit its armies as a vital component of its sovereign independence. He dreamed that China would acquire the unshackled ability to mobilize and use effective military power, for only that power would distinguish the new state from its humiliated predecessors.⁵

Similar to this dream of sovereign independence, was Mao's determination to "destroy the nuclear monopoly" of China's adversaries. To achieve this, Mao believed "...So long as U.S. imperialism possesses nuclear bombs, China must have them too."⁶ This belief became the fundamental rationale behind China's nuclear weapons program.

⁴ Assessment supported by a Chinese academic at DTRA China Experts' Meeting, 4 March 2003. For more information, see Section III.

⁵ John Wilson Lewis and Xue Litai. *China Builds the Bomb* (Stanford, CA: Stanford University Press, 1988) p 35.

⁶ *Ibid.*, p. 35.

B. Threat Perceptions

China has identified numerous threats to its security from the 1950's onward including the threat from U.S. nuclear blackmail and the threat of U.S. encirclement. In the early-1950's the Korean War and the events in the Taiwan Straits caused China to feel that it was being "bullied" or "blackmailed" by the United States. Also during this period, the United States tested a hydrogen bomb in the Pacific, announced the "massive retaliation" doctrine, and forged the U.S.-Taiwan Mutual Defense Treaty. Similarly, the Indochina crisis culminated and Southeast Asia Treaty Organization was formed.⁷ The convergence of these crises and milestones resulted in the launch of China's atomic bomb program around 1955. The establishment of the Atomic Research and Design Institute (*Yuanzineng Yanjiu Yuan*) in 1956, served as concrete evidence of China's commitment to pursuing nuclear weapons.⁸ The deterioration of the Sino-Soviet relationship in the late-1960's heightened the Chinese leadership's perceived threat environment and reinforced their desire for an independent nuclear capability.

C. Political Factors

Multiple political factors prompted early Chinese consideration of acquiring a nuclear weapon. Chief among these are the Chinese leadership's quest for international standing and the Sino-Soviet relationship. The former was a primary impetus behind the initiation of the program and the later was critical to the rapid success the Chinese nuclear program achieved.

International Standing. Beijing recognized early that an independent nuclear arsenal would further China's policies and enhance its international standing. Although Mao's formal authorization of the nuclear program likely did not occur until approximately 1956, some evidence of early thinking about a nuclear China can be found. The Chinese Communist Party (CCP) is said to have been pondering a nuclear weapons capability as early as 1946 when Kang Sheng, head of Communist China's secret service, began systematic recruitment of overseas Chinese nuclear and rocket scientists.⁹ In addition to recruiting the technical personnel necessary to initiate a nuclear program, in 1950-1951, the newly founded People's Republic of China (PRC) joined forces with the Soviet Union, and began large-scale uranium mining near Urumqi in Xinjian (Sinkiang).¹⁰ The evidence of early thinking about nuclear weapons suggests that the Chinese leadership recognized the political utility of nuclear weapons in addition to their security value.

Many claim that China sought a nuclear capability in order to increase prestige in the international community and prove its self-reliance. Mao, himself, characterized the significance of the atom bomb in 1958, when he told his senior colleagues that without atomic and hydrogen bombs, "others don't think what we say carries weight."¹¹ In addition, it has been argued that

⁷ H.C. Hinton, "Communist China's External Policy and Behavior as a Nuclear Power," *IDA Research Paper P-75*, 1963, p. 46.

⁸ Chong-Pin Lin. *China's Nuclear Weapons Strategy: Tradition within Evolution* (Lexington, MA: Lexington Books, 1988), pp. 45-46.

⁹ *Ibid.*

¹⁰ *Ibid.*

¹¹ Lewis and Xue Litai, *op. cit.*, p. 36.

China linked the atom bomb to its support for wars of national liberation, in particular the Vietnam War.¹² Similarly, nuclear capability may have been viewed as a means to enhance China's voice in the communist bloc, particularly with respect to disposition of the bloc's military power. China's ability to overcome technical hurdles independently and detonate a nuclear bomb enhanced its voice within the bloc by allowing China to launch what has been called a "Nuclear Peace Offensive." China's NFU pronouncement immediately after its first atomic detonation, its proposal for a global ban on the first use of nuclear weapons, and its recommendation for a conference with other countries to discuss the complete abolition and destruction of nuclear weapons placed China in a positive and prominent position within the international communist movement.¹³

Sino-Soviet Relations. The Sino-Soviet relationship was critical to the rapid success of the Chinese nuclear weapons program. Early on, the partnership allowed China to leapfrog certain technological hurdles. These jumps were facilitated by The New Defense Technical Accord of October 15, 1957, which provided for Soviet assistance to China "in such new technologies as rockets and aviation." In addition, the Soviet Union promised to supply China with blueprints for, and a working prototype of, an atomic bomb and missiles, as well as related data.¹⁴

However, the nuclear relationship between the Soviet Union and China was short-lived. Many contentious issues arose between the two countries in the late-1950's and early-1960's. For one, the USSR's refusal to deter the U.S. nuclear threat and assure China nuclear support during the Quemoy crisis in 1958 accelerated China's search for an independent option.¹⁵ It was the nuclear test ban issue, however, that appears to have severed the relationship completely. On June 20, 1959, the USSR's Central Committee sent its Chinese counterpart a letter stating that because of the nuclear test-ban negotiations in Geneva, the Soviet Union could not supply a prototype of a bomb and its technical data. Moscow feared that recent efforts to relieve tensions with the West would be undermined if the extent of Soviet nuclear aid to China were realized.

The nuclear test ban issue continuously gnawed at what both countries regarded as their vital interests; its ramification pushed them to a qualitatively new level of acrimony. Not only did it signal an open rift, but also became a major point of contention around which the adversaries tried to muster support within the world communist movement.¹⁶

Thus, the two countries parted ways, and the relationship ended completely with the departure of the Soviet Scientists from China in the summer of 1960.

Chinese anger over these developments eventually turned into security concerns about Soviet strategic intentions particularly throughout the late-1960's and 1970's. The Ussuri River Clash with the USSR in 1969 underscored to the Chinese leadership the possibility of Soviet

¹² Morton Halperin, "Chinese Nuclear Strategy: The Early Post-Detonation Period," *Asian Survey*, vol. 5, no. 6, June 1965, pp.271-279.

¹³ *Ibid.*

¹⁴ Matin Zuberi, "Soviet and American Technological Assistance and the Pace of Chinese Nuclear Tests," *Strategic Analysis*, vol. XXIV, no. 7, October 2000. Internet: http://ciaonet.org/olj/sa/sa_oct00zum01.html

¹⁵ P.R. Chari, "China's Nuclear Posture: An Evaluation," *Asian Survey*, vol. 18, no. 8, August 1978, pp. 817-828.

¹⁶ Zuberi, *op. cit.*

attack, particularly against nuclear plants and missile sites in northern China. These concerns were exacerbated by the weakness of China's conventional forces and the potential that an attack by the Soviets could result in the loss of Chinese territory. The Sino-Soviet rift caused China to become the "only nuclear weapons state that turned its thermonuclear apparatus on its former nuclear benefactor."¹⁷

D. Economic and Technical Factors

Economic and technical factors were critical to the formulation and progression of Chinese nuclear strategy, doctrine, and force posture. Traditional evaluations of Chinese nuclear strategy argue that China, like most developing countries, accommodated its policy to its technology.¹⁸ In recent years a more comprehensive approach has identified "patterns of rational strategic choice made for China's nuclear posture, though technology limited the realm of the possible for Chinese leaders. Perhaps it could be said that the Chinese made a virtue out of necessity in the construction of their nuclear deterrent, accepting the technological constraints of the system and making rational choices under those constraints."¹⁹

As a developing world state, China lacked both the resources and initially, the science and industrial base necessary to begin full-scale nuclear weapons production. The development of China's nuclear weapon program was without doubt, bounded by economics and also by domestic constraints on investment. For example, investment in China is dictated by the country's National Development Strategy, which determines both defense policy and overall military strategy. The current National Development Strategy features a long-term commitment to national modernization with an insistence that strategic capability be subordinated to long-term economic growth.²⁰ This economic constraint seems to have slowed the rate of innovation within the Chinese strategic nuclear and missile program, or so China argues.

Historically, however, it appears that economics constraints were lessened during the formative years of the Chinese nuclear program. The Chinese estimated that:

...the expenditures on their nuclear weapons program equaled the cost of building a large modern steel facility. The cost of the enterprise, from uranium mining to the finished bomb was about US \$4.1 billion in 1957 prices; this amount was spread over a period of ten years, between 1955 and 1964.²¹

These costs were accepted by China for a few reasons. First, in the aftermath of the Korean War, nationalism was at a peak in China, and the linkage of the atom bomb to increased international standing justified the expense. Secondly, for China, nuclear weapons were seen as a vehicle for establishing a scientific and industrial base.²² In fact, the scientific and national importance of

¹⁷ *Ibid.*

¹⁸ See for example, Sidney Drell, preface, Lewis and Litai, *op. cit.* p. xviii.

¹⁹ Bates Gill, James Mulvenon, and Mark Stokes, *op. cit.*, pp. 511-512.

²⁰ Xia Liping, "China's Nuclear Policy and Disarmament Policy," Center for International Strategic Studies, Shanghai Institute for International Studies, p 2.

²¹ Zuberi, *op. cit.*

²² Xue Litai, "Evolution of China's Nuclear Strategy," in John C. Hopkins and Weixing Hu, eds., *Strategic Views from the Second Tier* (New Brunswick: Transaction Publishers, 1995), p. 168.

the nuclear weapons program insulated it from many of the domestic economic and cultural pressures that could have significantly delayed the program, particularly during the Cultural Revolution and Gang of Four period.²³

Overall, however, China seems to have recognized its economic and military limitations, as well as the relationship between the two. A widely cited Chinese maxim explains that, “A rich state and a strong army (*fu guo quiang bing*) are inextricably linked, and form the basic road to security.”²⁴ Because China was not a rich state, it could not afford to build a world-class military. Accordingly, China opted to invest in qualitative rather than quantitative improvements in nuclear warheads and missiles, a choice that had direct consequences for China’s nuclear strategy and targeting posture. Because its missiles were based on liquid-fuel technology, China’s strategic nuclear forces had slow-reaction times and were vulnerable to preemptive attack. This necessitated the adoption of various dispersal and concealment measures to enhance survivability.

Marshal Nie Rongzhen,²⁵ head of China’s overall strategic weapons program after 1958, devised a weapons development strategy consistent with China’s technical and economic limitations. His program gave priority to technical research for qualitative improvements over quantitative augmentation.²⁶ Nie’s directives were consistent with Mao’s maxim: “Build a few (nuclear weapons), keep the number small, make the quality high (*you yidaian, shao yidan, hao yidian*).”²⁷ As a result of this strategy, China avoided the costly route of highly accurate delivery systems, focusing instead on high-yield nuclear weapons. The lack of accuracy, in turn, limited China to a counter-value as opposed to a counter-force targeting policy.

China reasoned that the ability to hold cities at risk was enough to ensure “mutual vulnerability” between nuclear powers. The development of this rationale also coincided with recognition on the Chinese part that numerical parity was not necessary to achieve a credible deterrent.²⁸ Brad Roberts, a prominent Western scholar, has argued “There is very little sentiment in China for competing in quantitative terms with other nuclear powers. Nuclear minimalism is deeply engrained and for decades has been seen as meeting the requirements of nuclear sufficiency.”²⁹ Based upon the constraints of the Chinese system, a “sufficient force” would be one that could inflict heavy damage on any prospective enemy’s principal population centers, and therefore dissuade any enemy from attacking first. Therefore, it was determined that

²³ Paul Dibb, “China’s Strategic Situation and Defense Priorities in the 1980s,” *The Australian Journal of Chinese Affairs* vol. 0, no. 5, Jan. 1981, pp. 97-115. Litai Xue, *op. cit.*, also suggests that the strategic weapons program was largely successful because it was isolated from the domestic pressures of the Cultural Revolution.

²⁴ Alastair Iain Johnston, “China’s New ‘Old Thinking’: The Concept of Limited Deterrence,” *International Security*, vol. 20, no. 3, Winter 1995/96, p. 7.

²⁵ Nie Rongzhen was Vice-Chairman of the CMC from 1959 on. He became the head of the overall strategic weapons program in 1958. He has often been called “the father” of China’s nuclear weapons program. See Lewis and Litai, *op. cit.*, p. 247.

²⁶ Chong-Pin Lin, *op. cit.*, p 51.

²⁷ Xue Litai, *op. cit.*, p. 171.

²⁸ Mao’s maxim “Small but better” (*shao er jing*) shaped the Chinese strategy, which emphasized that a limited but reliable force that could inflict heavy damage on an enemy’s populations center and would be sufficient to deter an adversary’s first strike. See Xue Litai, *op. cit.* p. 172 for more discussion.

²⁹ Brad Roberts, “Tripolar Stability: Relations Among the United States, Russia, and China,” *IDA Paper P37-27*, Sept. 2002, p. 24. Internet: <http://www.ida.org/IDAnew/Tasks/TripolarStability.pdf>

to deter the United States, China's ICBMs would have to reach New York and Washington; against the Russians, they would have to hit Moscow.³⁰

The convergence of these factors resulted in a nuclear strategy that rested on uncertainty and ambiguity as organizing principles. These fundamental components of the Chinese nuclear strategy are largely consistent with the centrality of deception to the Chinese strategic tradition. For example, the Sun Tzu maxim states, “All warfare is based on deception. Hence when able to attack, we must seem unable; when using our forces, we must seem inactive; when we are near, we must make the enemy believe we are far away; when far away, we must make him believe that we are near.”³¹

In short, these technical and economic considerations were salient determinants of China's nuclear strategy, which rests on the possibility that a few undetected Chinese ICBMs, launched in retaliation, is sufficient to deter an adversary from attempting a preemptive nuclear strike against China. As one Chinese academic has noted, it is the adversary's uncertainty regarding Chinese force estimates, rather than the total number of Chinese ICBMs that is directly relevant to the credibility of the Chinese deterrent in its current form.³² Foreign uncertainty about the precise size and location of its retaliatory force allowed China to achieve a “stable yet unbalanced”³³ relationship with the other nuclear powers and formed the foundation of China's “minimal deterrence” doctrine.

II. The Evolution of Chinese Nuclear Strategy, Doctrine, and Force Posture

U.S. and Chinese scholars both have recently acknowledged that perhaps China is approaching a stage in its nuclear evolution where decisions regarding its nuclear forces are less bound by technological and economic constraints, but rather by political considerations.³⁴ Other developments in the areas of political ideology, doctrine, strategic modernization, and the impact of multipolarity, suggest that China's nuclear strategy is on the road to a major reformulation.

³⁰ Xue Litai, *op. cit.*, 172. China initially relied on Hong-6 and Qian-5 aircraft as its primary nuclear delivery systems. However, as China's ballistic missile capabilities improved, land-based missiles became the primary nuclear weapons delivery system beginning in 1970, supplemented by a single *Xia* class (Type 092) nuclear-powered ballistic missile submarine, operationally deployed with its missiles in 1988. Sanders and Yuan, *op. cit.*, p. 3.

³¹ Sun Tzu, *The Art of War*, translated by Lionel Giles. Internet: <http://classics.mit.edu/Tzu/artwar.html>

³² Li Bin, “The Effects of NMD on Chinese Strategy,” *Janes International Security News*, 7 March 2001. Internet: http://janes.com/security/international_security/news/jir/jir010307_1_n.shtml

³³ Joanne Tompkins, “How U.S. Strategic Policy is Changing China's Nuclear Plans,” *Arms Control Today*, January/February 2003. Internet http://www.armscontrol.org/act/2003_01-02/tompkins_janfeb03.asp

³⁴ From DTRA China Experts' Meeting, 4 March 2003.

A. Political Ideology

China's assessment of its security was merged with the political ideology of the time to formulate its declaratory nuclear doctrine and strategy.³⁵ China's nuclear doctrine traditionally is formulated along CCP lines with occasional revisions of the doctrine based upon changing threats or technological opportunity.

Historically, China has taken a defensive stance on matters relating to its national security. Evident in the ancient classic military literature are statements of China's emphasis on defense rather than offense. One such example is that of an ancient Chinese thinker, Mo Zi, who devised the concept of "non-offense" (*fei gong*), which advocated responsive rather than provocative actions. This defensive tradition is manifest in the Great Wall of China.³⁶ In terms of nuclear strategy, Chinese emphasis is placed on the "retaliatory" nature of the deterrent in order to "defend China against the threat of strategic nuclear attack." This defensive stance has remained a constant in Chinese nuclear strategy and has been reinforced most recently in the 2002 Defense White Paper.³⁷

Mao Zedong originally formulated China's revolutionary struggle in terms of "Peoples War." He stressed the importance of "man over machine" and in 1946 derided the atom bomb as a "paper tiger." However, much of the Chinese leadership's reaction to nuclear weapons may have been an effort to counteract the effects of fear among its population. For example, Mao acknowledged "the 'unprecedented destructiveness; (*shashang li kongquian juda*), not the military decisiveness, of the weapons, but ... adamantly denied that nuclear threats would cow them."³⁸ In addition, Mao's derogatory rhetoric about nuclear weapons likely reflected China's lack of a credible nuclear capability at that time.

Mao's proclivity to conform nuclear strategy to his revolutionary ideals seems to have delayed any serious thinking about operational and use aspects of nuclear weapons. As noted, in the People's War doctrine, nuclear weapons did not feature prominently. Mao's few issued statements on the bomb came to be regarded as a complete set of guidelines for the nuclear weapons program. "His maxims and brief instructions provided grist for the mill of all planners and training commands, which dutifully issued their own statements, both secret and open."³⁹ Mao continued to downplay the role of nuclear weapons and it was not until he was assured of China's technological success in developing modern nuclear bombs and missiles that he recast the revolutionary struggle of "People's War" into one with a military-technical emphasis that relied on assured nuclear retaliation to ensure deterrence.⁴⁰

³⁵ It should be noted that China's declaratory and official nuclear doctrine and policies are not necessarily synonymous with its operational doctrine.

³⁶ Li Jijun, "Traditional Military Thinking and the Defensive Strategy of China," an address at the United States War College, *Letort Paper No. 1*, 29 August 1997.

³⁷ People's Republic of China. Information Office of the State Council, "White Paper on China's National Defense in 2002." Internet: <http://english.peopledaily.com.cn/features/ndpaper2002/nd.html>

³⁸ Mark A. Ryan, "Early Chinese Attitudes Toward Civil Defense Against Nuclear Attack," *Australian Journal of Chinese Affairs*, vol. 0, no. 21, Jan. 1989, pp. 81-109.

³⁹ Xue Litai, *op. cit.*, p. 171.

⁴⁰ Lewis and Xue Litai, *op. cit.*, p 222.

After Mao's death in 1976, more independent Chinese thinking about nuclear doctrine and use aspects commenced. The process however, progressed slowly.

Beginning about 1979, a few brave souls in the various military organs wrote some general think pieces on the subject of nuclear strategy, and some of these reached the top command a couple of years later....By about 1985, the initial draft document on nuclear strategy was circulated throughout China, and a year later Defense Minister Zhang Aiping said, "We have built a powerful national defense and possess a nuclear strike capability. The enemy no longer dares to strike [the first blow] or to underestimate us." Freed from the shackles of People's War, strategists then began a systematic elaboration of "China's concept" of deterrence. They avidly read the literature of the West and paid special attention to works on medium-sized nuclear powers, especially France.⁴¹

The strategic planning community at this time however, was divided into various schools of thought regarding the relative importance of Mao's ideals and the utility of nuclear weapons.

... A tendency emerged toward a division of opinion between the relatively professionally oriented officers of the PLA General Staff, led by Chief of Staff Su Yu, and the relatively Party-Oriented officers in the Defense Ministry, led by Defense Minister Peng Te-huai. The former stressed the importance of modern weapons, surprise attack, and the desirability of an independent Chinese strategic capability (presumably including nuclear weapons) regardless of expense, and by implication disparaged the capability of Mao's military thought and of rigid Party controls over the armed forces. The Defense Ministry officers, on the other hand, stressed the importance of men rather than weapons in modern war, the probability that even a nuclear war launched against China would be a "broken-backed" one in which China would ultimately emerge victorious, insisted that acquisition of a Chinese strategic capability be subordinated to long-term economic development, claimed to be confident that China could rely on Soviet deterrent protection, and exalted Mao's military thought and Party control over the armed forces.⁴²

The "Moderates," who sought to modernize in scale, comprised another group of strategic thinkers.⁴³ The debate amongst these groups was influential in transitioning China's doctrine from one of "People's War" to "People's War under Modern Conditions" and also paved the way for thinking about the strategy of Active Defense.

The threat perception of the Chinese leadership at this time was also a critical driver behind the shift from "People's War" to "People's War under Modern Conditions." For example, during the late-1970's and early-1980's the threat of Soviet attack was perceived as very real by the Chinese leadership. The Soviet threat forced China to accept the need for large-scale modernization of its armed forces, as well as a rethinking of China's standing strategic doctrine under "modern conditions."⁴⁴ Furthermore, the possibility of Soviet limited territorial gains highlighted the inadequacy of the "Peoples War" doctrine, which was designed for protracted conflicts.⁴⁵ In the early-1980's, Su Yu, Chief of the PLA's General Staff, introduced

⁴¹ Xue Litai, *op. cit.*, p. 173.

⁴² Hinton, *op. cit.*, pp 46-47

⁴³ Chari, *op. cit.*,

⁴⁴ Robert S Wang, "China's Evolving Strategic Doctrine," *Asian Survey*, vol. 25, no. 10, 1984, pp. 1040-1055.

⁴⁵ Chari, *op. cit.*

the doctrine of “Peoples War Under Modern Conditions.” This doctrine marked an important shift towards active defense, flexibility, and mobile warfare.⁴⁶

Active Defense has emerged as an important doctrine in its own right. It relies on early and decisive battles to ensure victory.⁴⁷ Notably, these battles are intended to be fought along China’s periphery, not deep within the interior as envisioned in traditional “People’s War” doctrine. Also in contrast to “People’s War,” Active Defense envisages limited wars. Chinese thinking on limited wars was initially prompted by the Falklands War, further influenced by the decline of the Soviet Union, and ultimately underscored by the Gulf War.⁴⁸

More recently, Active Defense has been described in China’s 2002 Defense White Paper as a combination of strategic defense with operational and tactical offensive operations during time of war.⁴⁹ China maintains that the scale, composition, and development of its nuclear weapons are in line with this doctrine, noting that its strategic missile forces, “enormously strengthen our army’s real power and nuclear deterrence capability, and are playing an increasingly important role in carrying out our country’s active defense strategy.”⁵⁰

The evolution of Chinese nuclear strategy is also reflected in statements by the leadership. For example, in 1985, Deng Xiaoping made a “Strategic Decision” that China no longer had to prepare to fight an early, large-scale and nuclear war.”⁵¹ The new orientation became one of “peacetime construction.” The operational guidelines for the “new” orientation, however, continued to emphasize the development of “key item (*zhong dian*) defense capabilities.”⁵² The guidelines reinforced nuclear weapons as a critical aspect of overall Chinese security.⁵³

More recently, Jiang Zemin highlighted the changing strategic environment and steps that China must take to ensure its continuing security. His “Five Musts” direct the following:

- (1) China “must own strategic nuclear weapons of a definite quality and quantity in order to ensure national security;”
- (2) China “must guarantee the safety of strategic nuclear bases against the loss of combat effectiveness from attacks and destruction by hostile countries;”
- (3) China “must ensure that our strategic nuclear weapons are at a high degree of war preparedness;”

⁴⁶ Dib, *op. cit.*

⁴⁷ Pande, Silva. “Chinese Nuclear Doctrine,” *Strategic Analysis*, March 2000, pp. 2011-1036. Internet: <http://www.idsa-india.org/an-mar00-2.html>

⁴⁸ Johnston, *op. cit.*, p. 28.

⁴⁹ Information Office of the State Council, China. “China’s National Defense in 2002,” 9 December 2002. Internet: <http://english.peopledaily.com.cn/features/ndpaper2002/nd.html>

⁵⁰ Johnston, *op. cit.*, p.9.

⁵¹ *Ibid.*

⁵² Chong-Pin Lin, *op. cit.*, p. 41.

⁵³ Hongxun Hua asserts that Deng’s “strategic transformation” calculated that world war would not occur for a long time and therefore the developmental program for nuclear weapons and strategic missiles was given lower priority than the development of conventional tactical missiles. He claims that in terms of nuclear strategy, China practiced a ‘limited development’ policy. See Hongzun Hua, “Viewpoint: China’s Strategic Missile Programs: Limited Aims, not Limited Deterrence,” *Nonproliferation Review*, Winter 1998, p. 63.

- (4) “When an aggressor launches a nuclear attack against us, we must be able to launch nuclear counterattack and nuclear re-attack against the aggressor;”
- (5) China “must pay attention to the global situation of strategic balance and stability, and, when there are changes in the situation, adjust our strategic nuclear weapon development strategy in a timely manner.”⁵⁴

The evolution of China’s political ideology, evident through changes in official statements and defense white papers has helped to shape China’s nuclear strategy. Many of the fundamental elements of the early strategy, “People’s War” remain to this day, and more recent expressions of ideology such as Active Defense and People’s War Under Modern Conditions are reflected in the current composition of both China’s nuclear and conventional forces.

B. The Doctrinal Debate

In recent years much debate has taken place in the West over China’s current nuclear doctrine and whether it is shifting from “minimum deterrence” to “limited deterrence.” Recent studies, which look to military journals and writings of Chinese strategists have put forth several options for what China’s nuclear doctrine *should* ultimately resemble. Ambiguity exists due to the various translations and meanings of the term “deterrence” in Chinese.⁵⁵ But, when these conceptual frameworks are compared with the nuclear capabilities China is believed to possess, it is possible to draw some conclusions about which of these options China’s nuclear doctrine most closely resembles.

Several possibilities exist and have been expanded upon by U.S. analysts. The spectrum of these options is presented here:

Minimum Deterrence. For China, a minimum deterrence doctrine rests on the assumption that a small number of warheads, launched in a counter-value second strike, is sufficient to inflict unacceptable damage on an adversary. The requirement for minimum deterrence is the ability to deliver against an opponent from a handful to several tens of nuclear weapons, a requirement that China’s current force posture currently meets.

In line with the Chinese strategic tradition that stresses minimalism, ambiguity, flexibility, and patience, China has constructed a small triad of aircraft, land-based missiles and submarine-launched missiles. This force is backed by an emphasis on deception and denial, particularly with respect to targeting and launch doctrine. This posture allows China to keep adversaries uncertain about their ability to achieve nuclear or conventional victory.⁵⁶

⁵⁴ “Jiang Zemin Defines Position of China’s Strategic Nuclear Weapons,” *Tai yang pao*, Hong Kong, 17 July 2000. FBIS CPP20000717000021.

⁵⁵ Iain Johnston describes this ambiguity: “The Chinese terms for deterrence – *wei she* – is ambiguous. It literally means to use awesomeness, or latent power, to terrorize. Often the concept is described by a four character idiom – *yin er bu fa* - meaning to “draw the bow but not shoot.” This leaves two somewhat contradictory impressions. One is of massive, undifferentiated, virtually automatic retaliation – an image closer to assured destruction visions of deterrence. The other is the threat of accurately targeted, precise, almost surgical violence – an image closer to war-fighting notions of deterrence.”⁵⁵ See Johnston, *op. cit.*

⁵⁶ *Ibid.*, p.11

However, as one prominent Western analyst contends, “a state that accepts minimum deterrence readily accepts qualitative and quantitative inferiority.”⁵⁷ This inferiority and the capabilities parallel with it, leave China inherently vulnerable to a disarming first strike. Furthermore, a minimum deterrence doctrine and comparable force posture preclude the option of intrawar deterrence.⁵⁸ In order for China to achieve a *credible* minimum deterrence posture, it is necessary for China to improve the reliability and survivability of its nuclear forces. Recent Chinese writings on nuclear doctrine seem to be in line with this requirement.

Minimum Deterrence “Plus.” A few analysts have suggested that it is possible for China to continue to adhere to a doctrine of minimum deterrence while simultaneously making incremental improvements to compensate for changes in China’s security environment. For example, some analysts have suggested that China seeks a minimal deterrent plus launch on warning (LOW) capability. China might also supplement minimum deterrence with the capability to penetrate an adversary’s missile defenses.

A doctrinal shift towards a LOW posture would not require significant increases in the numbers of China’s strategic nuclear forces; the adoption of this capability could occur within a minimum deterrence construct. It has been noted that China’s new generation of DF-31 and DF-31A missiles will have relatively short launch-preparation times that would make launch-on-warning technically possible.⁵⁹ A decision to pursue such capability could potentially be linked to US deployment of missile defenses, among other things. The potential implications of a LOW posture for crisis stability is discussed in Section V, below.

The need to maintain a credible nuclear retaliatory capability in the face of national missile defenses would likely push China to speed up its ballistic missile modernization programs, increase deployments of current missiles, or some combination of the two.⁶⁰ Other options have been suggested as well, such as the development and deployment of technical countermeasures to defeat missile defense systems, or potentially the development of asymmetrical measures such as anti-satellite weapons. Furthermore, it is likely that the deployment of U.S. missile defense will prompt China’s counter-deployment of multiple reentry vehicles (MRVs), multiple independently targetable reentry vehicles (MIRVs), and/or other penetration aids. The ultimate scope of such deployments would largely determine whether they could be construed as consistent with a minimal deterrent.

Limited Deterrence. Iain Johnston argues “Chinese strategists have developed a concept of ‘limited deterrence’ (*you xian wei she*) ... [which] requires sufficient counter-force and counter-value tactical, theater, and strategic nuclear forces to deter the escalation of conventional or nuclear war. If deterrence fails, this capability should be sufficient to control escalation.”⁶¹

⁵⁷ Johnston, *op. cit.*, p. 18

⁵⁸ *Ibid.*

⁵⁹ *Ibid.*, p. 22.

⁶⁰ Saunders and Yuan, *op. cit.*, p. 15.

⁶¹ Johnston, *op. cit.*, p.5. (Johnston’s assessments are based upon primary materials published in Chinese military journals).

Limited deterrence suggests a doctrinal divergence from minimum deterrence in terms of capabilities, objectives, and assumptions. A limited deterrence strategy would require an increased number of nuclear strike forces, in addition to a LOW posture – a capability that would require significant investment in radar and early warning technology. Also, a limited deterrent would call into question China’s NFU pledge. Finally, the Chinese assumption inherent in minimum deterrence, that nuclear weapons are not useable, would be contradicted in a limited deterrent doctrine, which in many ways rests on the utility and operational usability of nuclear weapons.⁶²

China’s current force posture does not appear to be aligned with this doctrine. Limited nuclear deterrence, at this time, is perhaps an “aspirational doctrine” for the Chinese and could eventually have implications for Chinese decisions regarding strategic modernization. Alternatively, the limited deterrence doctrine may already be incorporated into Chinese nuclear strategy, but with more applicability at the theater nuclear level.

Tiered Deterrence.⁶³ Bates Gill, James Mulvenon, and Mark Stokes describe China’s nuclear strategy in three distinct levels: a posture of *credible minimal deterrence* with regard to the continental United States and Russia; a more offensive-oriented posture of *limited deterrence* with regard to China’s theater nuclear forces; and an *offensively configured, preemptive, counter-force warfighting posture* of “active defense” or “offensive defense” for the Second Artillery’s conventional missile forces.⁶⁴

This variation asserts that the Chinese nuclear force structure defies simple categorization as either a limited or minimal deterrent. Instead, the multi-faceted force is made up of strategic, theater, and tactical systems of varying range, accuracy, and yield.

The complexity and multifaceted challenges that China must consider in its strategic planning seem to indicate the minimum versus limited dichotomy is no longer accurate, particularly as Beijing seeks to integrate “flexibility” into its force planning.

Maximum Deterrence. Chinese strategists view this form of deterrence as being characteristic of both U.S. and Soviet doctrine. This form of deterrence stresses war-fighting and war-winning nuclear capabilities. However, China eschews this notion of deterrence, foremost because it contravenes China’s commitment to NFU and also due to the economic and technical commitments necessary to pursue such a deterrent.⁶⁵

At this time, it appears likely that China’s nuclear doctrine most closely resembles a tiered deterrent. This deterrence construct takes into account China’s need to plan vis-à-vis regional adversaries and reflects China’s mixed force posture. At the strategic level vis-à-vis the United States, China most likely still subscribes to a minimum deterrence posture while incrementally improving the survivability and reliability of its nuclear weapons so as to maintain the credibility of the deterrent. In time, it is possible that strategic modernization could include

⁶² *Ibid.*, p. 12.

⁶³ Gill, Mulvenon, and Stokes, *op. cit.*, p. 512

⁶⁴ *Ibid.*, p. 512.

⁶⁵ Johnston, *op. cit.*, p 19.

efforts to counteract U.S. missile defense, or possibly incorporate a LOW posture. At the theater level, a shift towards limited deterrence appears likely, particularly in that intrawar deterrence, a component of limited deterrence, would be critical in a theater contingency (i.e., US-China-Taiwan). Finally, as Gill, et al., has argued, the deployment of dual-capable conventional missiles suggests an “offensive-defense” conventional posture for China.

C. Strategic Modernization

The rate of strategic modernization of China’s nuclear forces is also influenced by threat perceptions and assessments of the international security environment, national prestige, and domestic priorities. Similarly, technology and economics either facilitate or constrain implementation of the modernization directives.⁶⁶

This pattern can be seen historically and is also emerging in current assessments of Chinese strategic modernization. For example, during the Deng Xiaoping Era, while massive reductions of the PLA were underway, the Reagan Administration’s Strategic Defense Initiative (SDI) had important implications for Chinese nuclear strategy. SDI is said to have “rekindled debates among Chinese strategic analysts and raised important issues for China’s limited nuclear forces. Beijing feared that the U.S. missile defenses could trigger certain Soviet reactions (including the possible development and deployment of Moscow’s own space-based missile defenses) that might neutralize China’s limited nuclear deterrent.”⁶⁷

Similar concerns appear to be governing the current Chinese debate over strategic modernization of its forces. In addition to the issue of missile defense, U.S. advancements in non-nuclear conventional strike are of concern to Chinese analysts. In particular, the recent Nuclear Posture Review (NPR) identifies a “New Triad,” while simultaneously mentioning China as a potential target. China first noted U.S. improvements in advanced conventional strike during Operation Desert Storm and in U.S. actions in Yugoslavia.⁶⁸ U.S. capabilities underscored China’s need for military modernization and the ensuing directives for China’s strategic nuclear weapons were to enhance survivability, and striking ability, and to improve penetration technology.

Other aspects of the current China-US relationship are also shaping the evolution of China’s nuclear strategy. China’s perception that the United States seeks “absolute security and at China’s expense” has heightened Chinese concerns.⁶⁹ On May 1, 2001, President Bush stated “Deterrence can no longer be based solely on the threat of nuclear retaliation. We need new concepts of deterrence that rely on both offensive and defensive forces.”⁷⁰ This statement was followed by the U.S. withdrawal from the ABM treaty on June 13, 2001. The fundamental

⁶⁶ Saunders and Yuan, *op. cit.*, p. 8.

⁶⁷ *Ibid.*, p. 9

⁶⁸ For example, Xue Litai claims “The rapid development of antiaircraft weapons systems, particularly those used by the United States in the 1991 Gulf War, made questionable the penetrability of any bomber weapons without very advanced avionics, Stealth, and standoff missiles. [This] caused some PLA planners to currently dismiss the listing of China’s antiquated bombers as a viable leg of the triad.” See Xue Litai, *op. cit.*, p. 175.

⁶⁹ Roberts, *op. cit.*, p 23.

⁷⁰ President Bush’s address at US National Defense University, May 1, 2001. Internet: www.whitehouse.gov/news/releases/2001/05/20010501-10.html.

Chinese apprehension appears to be that the concept of “deterrence by denial” will supercede traditional “deterrence by retaliation,” thereby neutralizing the Chinese deterrent.

Chinese anxiety about U.S. missile defense is exacerbated by the prospect that US-Russia cooperation on missile defense could potentially render the Chinese deterrent impotent. It has been noted that in the post-Cold War environment,

Strategists in Beijing also see their extant capabilities as a hedge against any reversals in Russian internal politics that could again find Moscow as a prospective security threat; their nuclear forces are also a presumed ‘insurance policy’ against the prospect of significantly heightened U.S.-Chinese antagonisms. In addition, a highly collaborative relationship between Russia and America might prove complicating to the Chinese, especially if it entailed collaboration in areas that the Chinese might regard as undermining the credibility of their deterrent posture (e.g., defensive systems).⁷¹

These insecurities foster wariness in Chinese strategic planning, and the contentious issue of missile defense is supplemented by arguments often made by China, that neither Washington nor Moscow have agreed to NFU pledges and that the extent to which the reductions of the Strategic Offensive Reduction Treaty will be implemented is still unclear. Thus, it appears that the tripolar relations between the United States, Russia, and China will have uncertainty built-in, therefore making hedges in both force posture and infrastructure an integral part of each country’s respective strategy.

As China considers these threats and plans its forces to accommodate them, technological constraints bound the extent to which the leadership can achieve its desired force composition. U.S. scholars often discuss China’s “aspirational doctrine,” which describes where China envisions itself, however scholars contend that the convergence of aspirational doctrine and technical capability has yet to occur, and thus a “capabilities-doctrine gap” exists within Chinese nuclear strategy.⁷² However, as strategic modernization of China’s nuclear arsenal continues, this gap may narrow.

D. Multi-polarity

In the post-Cold War environment, Chinese strategic modernization is impacted by China’s need to consider other regional actors, namely India and Japan. Although some debate exists with respect to the relative importance of India to Chinese strategic planning, some important points should be noted. To begin, China operates from a position of strategic superiority when planning against India. Although China does not appear to be overly concerned about Indian capability, due mainly to the slow rate of Indian missile deployment, potential developments such as mobile Agni-tipped missiles in the Himalayan mountains force China to consider and hedge against such a potential threat.⁷³

⁷¹ Jonathan Pollack, “The Future of China’s Nuclear Weapons Policy,” in John C. Hopkins and Wiesing Hu, eds., *Strategic Views from the Second Tier*, (New Brunswick: Transaction Publishers 1995) p 159.

⁷² *Ibid.*, p.31

⁷³ See Section III of this report for more discussion of Chinese strategic planning vis-à-vis India.

Japan is also a consideration driving Chinese strategic modernization. Current uncertainty regarding the outcome of events on the Korean Peninsula could prompt Japan to pursue a nuclear capability. If such an event were to occur, China's strategic force would need to be flexible in adapting to this challenge.

III. Target Selection

Similar to most of the aspects of Chinese nuclear strategy, publicly available data regarding China's nuclear targeting posture is sparse. However, open source assessments of missile bases and ranges provide insight into China's likely targeting posture.⁷⁴

In line with a minimum nuclear deterrent posture, China needs only to hold a few major adversary population centers at risk in order to for its deterrent to be credible. Historically, it is said that China developed a draft plan in 1963, which directed missile engineers to build "four types of missiles in eight years." The resultant missiles were the DF-2, DF-3, DF-4, and DF-5 missiles. The presumed targets in the draft plan formulated in 1964 were Japan (DF-2), the Philippines (DF-3), Guam (DF-4) and the continental United States (DF-5). After Sino-Soviet military confrontation over the Ussuri River in September 1969, the range of the DF-4 was increased to 4,750 kilometers, bringing Soviet cities within its orbit.⁷⁵

As China's nuclear force posture has changed, so too have the assigned targets. For example, the DF-2 was initially based to target Japan, but has been removed from service and its targeting requirements most likely assigned to the DF-3. Similarly, the DF-3 was initially targeted at US military bases in the Philippines, but since the United States closed those bases in the late-1980s, these missiles are now likely targeted at Taiwan, Northeast Asia, and Southeast Asia.

China is currently developing a second-generation of missiles, such as the DF-31. These solid fueled missiles are expected to be deployed to launch sites in Manchuria and targeted toward the northwest corner of the United States.⁷⁶

In trying to determine what constitutes "unacceptable damage," cultural dimensions must be considered. In discussions with a Chinese academic, it was offered as a notional guide to Chinese strategic thinking that the loss of ten cities is what the Chinese have traditionally considered to be "unacceptable" to the United States. However, he claimed that the Chinese assumption is that Washington would not willingly absorb *even one* counterattack strike. Since China can be assured of at least that capability, Washington would not make a decision to strike China first. He provided another formula for unacceptable damage, claiming that if 10 retaliatory warheads survived, hitting 5% of the population and 10-20% of industry, the resultant damage would suffice as unacceptable. He also noted that these estimates, however, could be

⁷⁴ For discussion of bases see the Appendix, particularly table I-2.

⁷⁵ Lewis and Xue Litai., *op. cit.*, p 212.

⁷⁶ David Tanks, "Chapter 3: China and Northeast Asian Powers: The Great Challenge of Tomorrow," *Exploring U.S. Missile Defense Requirements in 2010: What are the Policy and Technology Challenges* (Washington, D.C.: Institute for Foreign Policy Analysis, April 1997). Internet: <http://www.ifpa.org/pubs/2010/2010toc.htm>.

expanded if more resources became available.⁷⁷ Dr. Li Bin, another Chinese academic, assesses “unacceptable damage” by looking at the history of recent U.S. conventional wars. He argues,

The U.S. ended two wars without winning them in the last half century: the Korean and Vietnam conflicts. There were several reasons for the U.S. withdrawing from these two wars. One important and common reason is that each war had caused tens of thousands of American casualties. So, I assume that the U.S. would choose other options rather than launching a nuclear strike against China in a crisis if the U.S. understands that the strike would initiate a Chinese nuclear retaliation and that the retaliation can cause more American casualties than the above figures: tens of thousands. A nuclear bomb with a yield of about one megaton TNT equivalent exploded over a big city would certainly cause many more casualties than tens of thousands. So, a Chinese retaliatory strike with a few nuclear warheads should be able to deter a first nuclear attack from the U.S.⁷⁸

“Area targeting theory,” is one description of Chinese targeting policy, which rests upon a statement made by General Zhang Aiping. He reportedly said “If a nuclear war breaks out between China and the Soviet Union, I don’t think there is too much difference between the results, provided China’s ICBM misses its predetermined target, the Kremlin, and instead hits the Bolshoi Theater.”⁷⁹ This theory posits that, China’s nuclear weapons, given their large yield and low accuracy, could be used only as a retaliatory means to hit soft targets, including political and economic centers, strategic-weapons bases, navy and air force bases, key positions of communication, leadership centers, and troop concentrations.

However, scholars who adhere to the “limited deterrence” school believe that recent articles and discussions by Chinese strategists indicate that Chinese targeting posture extends beyond area targeting. Arguments for this position rest upon lists developed by Chinese strategists about what targets China’s strategic missile forces must be able to hold at risk. They include the ability to strike:

- Enemy strategic missile bases and weapons stockpiles, major naval and air bases, heavy troop concentrations, and strategic reserve forces, and thus destroy the enemy’s strategic attack capabilities;
- The enemy’s theater through strategic political and military command centers and communication hubs, thereby weakening its administrative and command capabilities;
- The enemy’s strategic warning and defense systems;
- The enemy’s rail hubs, bridges, and other important targets in its transportation network;
- Basic industrial and military industrial targets;
- Several political and economic centers so as to create social chaos.

Finally, the list states that the SMF should have the ability to launch warning strikes in order to undermine the enemy’s will to launch nuclear strikes, and thereby contain nuclear escalations.⁸⁰ Such lists could be another example of Chinese “aspirational doctrine” or perhaps, a more accurate reflection of China’s current targeting posture.

⁷⁷ From DTRA China Expert’s Meeting, 4 March 2003.

⁷⁸ Li Bin, “The Impact Of U.S. NMD On Chinese Nuclear Modernization,” *Pugwash Online*, April 2001. Internet: <http://www.pugwash.org/reports/rc/rc8e.htm>

⁷⁹ Xue Litai, *op. cit.*, p. 180.

⁸⁰ Johnston citing Liu and Meng, *Xiandai jundui zhihui*, pp. 392, 401, 405. See Johnston, *op. cit.*, p. 20.

IV. Communication of the Deterrent by the Chinese

For China, the communication of its deterrent is increasingly more complex than that of other nuclear armed nations, not least of all because of differences in terminology and cultural interpretations about nuclear deterrence. From the Chinese perspective, a tension exists between nuclear weapons and deterrence, in that traditionally both are seen as tools and terms of “Capitalists.”⁸¹

In the Chinese tradition of Confucianism, the phrase “deter” means *threatening* with nuclear force and thus emphasizes “offensive deterrence” as opposed to defensive deterrence. Therefore, the term “deterrence” is perceived as contrary to China’s NFU pledge, and is a persistent terminology problem in bi-lateral communications.⁸² Some Chinese strategists still claim that China does not practice deterrence but adheres to a doctrine of “defense” (*fangyu*) or “self protection” (*zei wei*).⁸³

Historically, ideology has further distorted China’s nuclear pronouncements. For example:

Except for a brief period in 1955, Chinese public statements have in principle disparaged the impact of nuclear weapons on modern military operations and strategic concepts. As differences between the Soviet Union and China became more open after mid-1959, the question on “war” became one of the major issues in the public exchange. Not only did the Chinese argue that war was inevitable, but they insisted that nuclear war would not result in the annihilation of mankind, only of capitalism. The international response was that CCP underestimated the destructiveness of nuclear war.⁸⁴

Upon the realization that such an international perception could perhaps render China even more vulnerable to a preemptive nuclear strike by the other nuclear powers, Chinese public discourse began to incorporate the severity of nuclear weapons into its discussions.

In October 2000, China’s Defense White paper stated the main elements of China’s nuclear deterrent:

China possesses a small number of nuclear weapons entirely for self-defense...China maintains a small but effective nuclear counterattacking force in order to deter possible nuclear attacks by other countries. Any such attack will inevitably result in a retaliatory nuclear counterstrike by China. China has always kept the number of its nuclear weapons at a low level.⁸⁵

Chinese strategists understand that fundamentally deterrence must include physical capability and the will to use the capability if deterrence fails:

⁸¹ This point was made by a Chinese academic at the DTRA China Experts’ Meeting, 4 March 2003.

⁸² Bates Gill and James Mulvenon, “China and WMD: Implications for the U.S.” paper presented at the NIC Conference, 5 Nov. 1999, Internet:

http://www.cia.gov/nic/pubs/conference_reports/weapons_mass_destruction.html

⁸³ Johnston, *op. cit.*, p 11.

⁸⁴ Alice Langley Hsieh, *Communist China and Nuclear Force* (Santa Monica: RAND, 1963), p. 11.

⁸⁵ People’s Republic of China, Information Office of the State Council, *China’s National Defense in 2000*. Internet: <http://www.fas.org/nuke/guide/china/doctrine/cnd0010/china-001016wp.htm>

Without the prerequisite that nuclear weapons could possibly be used in a real war, then nuclear weapons cannot be political tools and have deterrent value. If we do not have the determination and real capability to dare implement a nuclear attack on the enemy through powerful retaliation, then our nuclear power loses its deterrent value in constraining the outbreak of war.⁸⁶

Within the context of the US-China relationship, it is uncertain as to both sides' understanding of the other's modes of signaling and communicating their deterrent. This is in part due to the communication gap between the two countries, forged by cultural and language differences. In addition, it has been suggested that perhaps the United States is not tuned to look for and recognize any such signals that China may attempt to convey. This may be, in part, because the United States still expects signaling in the modes used by the Soviets, i.e., through movement of forces. The failure to effectively communicate or receive the other country's messages could have significant implications, particularly during a time of crisis and also with respect to any re-consideration on the Chinese part of the NFU policy.

V. China's Perspectives on Stability of Deterrence at Low Levels of Nuclear Weapons

Recent strategic dialogue between U.S. and Chinese academics and analysts has provided some clarification about the differing perspectives regarding strategic stability between the two countries. One such interaction identified two broad schools of thought with respect to the relative contributions of nuclear weapons, nuclear deterrence, and missile defenses to international strategic stability.⁸⁷

The first school of thought assumes that strategic stability requires a balance of power, and the unpredictable future balance of power between Beijing and the Washington is a potential source of instability. Instability in this sense could be derived from concerns about whether China will become a challenger or guarantor of the status quo. The alternative school of thought derives from the Cold War construct. This traditional sense of stability is comprised of two parts: *crisis stability*, which means the stability of deterrence during political-military crises so that neither side feels compelled to launch a first-strike and *arms race stability*, which focuses on the evolution of military balances over time.⁸⁸

The different schools of thought prove the strategic stability debate is multi-faceted and includes both conceptual aspects of strategic stability and policy aspects of strategic stability. Both are considered here, in the context of potential factors that could undermine strategic stability.

⁸⁶ Johnston translating Zhoa and Zahn, "He zhanzheng," p. 592. See Johnston, *op. cit.*, p 16.

⁸⁷ Evan Medeiros and Phillip Saunders. eds., "Building a Global Strategic Framework for the 21st Century": *Fourth U.S. – China Conference on Arms Control, Disarmament, and Nonproliferation* (Monterey, CA: Center for Nonproliferation Studies, Monterey Institute of International Studies, June 2002), p. 7. Internet:

<http://cns.miis.edu/cns/projects/eancp/research/uschina4/4thconf.pdf>
⁸⁸ *Ibid.*, p.7.

A. Uncertainty and Ambiguity

Obscurity is rooted in the historical evolution of the Chinese nuclear program. Particularly, in the foundational stages of the program, the Chinese calculus of nuclear deterrence included uncertainty about what constituted appropriate estimates of a survivable retaliatory capability, and in many ways underscored the vulnerability of the Chinese nuclear program to a preemptive or first strike. This willingness to use uncertainty as opposed to numeric parity or sufficiency for a credible deterrent differed greatly from other nuclear powers.⁸⁹

In order to minimize its vulnerabilities, particularly during a time of crisis, China dispersed its systems, and provided minimal information about the specifics of its deployments. In the mid-1980's, improvements in its nuclear forces permitted China to claim greater confidence in its deterrent's capability to credibly withstand a first strike. However, to this day, the Chinese remain unwilling to spell out in detail the ultimate objectives of their programs with respect to force mix, targeting doctrine, or optimum force balances between China and the major nuclear powers.⁹⁰

The centrality of uncertainty in the Chinese nuclear strategy could potentially undermine strategic stability, particularly in the context of arms reductions by the other nuclear powers. The potential asymmetries that could result from the lack of transparency between the nations has the potential to create a hedging race of sorts, to ensure that the United States never needs to accommodate China as its nuclear peer. To this extent, it has been noted by scholars that the United States is unwilling to accept a mutual deterrence relationship with China.

B. Missile Defense

The potential impact of U.S. missile defense on the Chinese deterrent and by extension, on strategic stability must be examined in the context of the overall environment in which such a decision is occurring. To begin, U.S. government publications, (e.g., 2001 NIE Missile Report, Nuclear Posture Review) continue to portray China as a nuclear threat to the United States. Other U.S. decisions such as the rejection of the Comprehensive Nuclear Test Ban Treaty (CTBT) and growing U.S. interest in space all heighten Chinese concerns that Washington is seeking "absolute security." The foremost of these concerns, however, is U.S. plans to pursue a missile defense system, a decision that, to Chinese thinking, could render China's deterrent impotent.

Li Bin, a Chinese nuclear expert, argues "China fear[s] that if the USA believes that a first strike plus NMD system could render impotent China's nuclear retaliatory capability, the USA might become less cautious during any crisis involving China...(This) would therefore

⁸⁹ Brad Roberts has argued "China is a different kind of nuclear actor. Its nuclear posture is rather different than...(US and Russia) – it has sought strategic stability not in large numbers and effective counter-force but in minimum deterrence backed by a robust emphasis on deception and denial. Its strategic force heavily emphasizes theater capabilities as well as conventionally tipped ballistic missiles, on the argument that these are more useable than nuclear tipped missiles and thus ought to be more credible." See Roberts, *op. cit.*, p 16.

⁹⁰ Pollack, *op. cit.*, p. 164.

disturb the strategic stability between China and the USA and would increase the risk of conflict.”⁹¹

The conceptual stability issue that seems to be underlying this debate is the shift in strategy from “deterrence-by-retaliation” to “deterrence by denial.” Many Chinese scholars view MAD as contributing to strategic stability, in part because the costs to either side are considered too great to invite either side to initiate a first strike. However, the introduction of defenses to one sides’ deterrent reduces the costs of a first strike to that country, thereby making it easier to launch a first strike and ultimately, undermining the stability of the deterrent relationship. The divergent views between the two countries on this issue were captured in this project by one U.S. analysts who offered “Whereas MAD is seen as a point of arrival for the Chinese, MAD is seen as a point of departure for the United States.”⁹²

The issue of missile defense and a shift from MAD highlights the various levels of meaning of “stability.” A Chinese academic identified these levels in the MAD and missile defense context. First, he identified the political stability of a relationship, for example between China and the United States, and claimed that in China, this is the stability connotation most often used. He identified another level as well, which is more nuanced, and entails a balance, which no one seeks to upset. Finally, he identified the level that describes the balance of strategic offense and strategic defense. With respect to this level of stability, he claimed China favors the balance that was achieved by MAD.⁹³

He argued that China recognizes that recent technical advances might alter stability on many levels. For example, China’s technical community feels that MIRVing could potentially cause instability. Therefore, China has technical and political reasons to maintain only its current force posture. He added, that China will check the United States with respect to missile defense, but it will not take any drastic actions so as to undermine political stability.⁹⁴

The prospect of missile defense underscores the more fundamental stability issue for China: the U.S. pursuit of “absolute security at the expense of international security.”⁹⁵ Recent U.S. actions may already be eroding stability, particularly if Beijing begins to question the validity of U.S. public and private assurances. It has been noted that, “the crux of the problem between Washington and Beijing is that the former wants flexibility in its planning while China wants strategic assurances about what the United States will not do.”⁹⁶

C. The NFU Pledge

China’s “retaliatory deterrence” doctrine features a commitment that China will not be the first to use nuclear weapons. This No First Use (NFU) statement is somewhat ambiguous in

⁹¹ Li Bin, *op. cit.*

<http://www.pugwash.org/reports/rc/rc8e.htm>

⁹² See Section III of the study for further discussion.

⁹³ *Ibid.*

⁹⁴ *Ibid.*

⁹⁵ Sanders and Medeiros, *op. cit.* p. 16

⁹⁶ *Ibid.*, p 13.

its operational meaning and thus prompts many questions about the conditions and timings upon which China would launch a retaliatory strike. Some U.S. scholars have argued,

[The] NFU pledge is probably less an altruistic principle, and more a simple reflection of the traditional operational constraints imposed on Chinese doctrine by the country's qualitatively and quantitatively limited nuclear arsenal: China maintains a NFU pledge because it fits with the realities of nuclear weapons inventory. As its force structure changes, so too might its NFU principle.⁹⁷

A Chinese academic has also recommended that China should reevaluate its NFU policy. He suggested that the NFU pledge could be disregarded under three conditions:

- 1) China's nuclear weapons were attacked with non-nuclear weapons;
- 2) China's nuclear weapons were attacked by other WMD; or
- 3) China's core interests (i.e., Taiwan) were at stake.

This "conditional" NFU pledge, he argued, would bolster Chinese deterrence; however it has significant implications for stability. U.S. uncertainty about the assuredness of the NFU pledge, combined with China's lack of transparency about its nuclear forces leaves much room for miscommunication and misperceptions – a situation which could potentially undermine strategic stability.⁹⁸

Furthermore, a conditional NFU posture, discards the inherently passive nature of Chinese nuclear capabilities. A conditional NFU implies a shift to a LOW posture. Such a shift has the potential to undermine strategic stability in that it increases chances for unauthorized or accidental launch.⁹⁹

D. Taiwan

The issue of Taiwan also has the potential to undermine strategic stability, particularly at the theater level. The Taiwan issue raises questions about intra-war deterrence and escalation control. A U.S. scholar has argued that the issue of regional deterrence and Taiwan is in many ways a Chinese analogue to the pre-strategic, nuclear warning shot reflected in French and British nuclear doctrine. Within the theater, Chinese ballistic missiles are dual-capable, and this force posture signals, from the start, that there is potential for surprise and for nuclear use. This overtly constructed force posture is designed to sow uncertainty, and this uncertainty could undermine stability in a regional contingency.

Furthermore, the issue of Taiwan has been cited by China as an issue of national and vital importance to the Chinese.

The Chinese Government has consistently adhered to the one-China principle and will never give in or compromise on the fundamental issues concerning state sovereignty and territorial integrity.

⁹⁷ Gill, Mulvenon, and Stokes, *op. cit.*, p. 516.

⁹⁸ While officially there does not appear to be any significant interest in a conditional NFU posture, the same Chinese academic claimed that in private conversations, some PLA generals had given this concept consideration.

⁹⁹ Saunders and Yuan, *op. cit.*

...However, if a grave turn of events occurs leading to the separation of Taiwan from China in any name, ... then the Chinese Government will have no choice but to adopt all drastic measures possible, including the use of force, to safeguard China's sovereignty and territorial integrity.¹⁰⁰

U.S. scholars posit that the Taiwan issue could potentially undermine strategic stability if the stakes for each side – U.S., China, and Taiwan - are not accurately assessed. Such an asymmetry could perpetuate an environment in which miscalculation could lead to rapid escalation.

¹⁰⁰ China's Defense White Paper 2000, *op. cit.*

APPENDIX: CHINA'S NUCLEAR FORCE POSTURE

I. Nuclear Force Posture

Open sources typically put the Chinese nuclear arsenal at 300 strategic and 150 tactical weapons. China has developed a classic triad of nuclear delivery systems, including land-based missiles, ballistic missile submarines, and aircraft. Table I-1 provides an open source summary of China's current and future missile capabilities.

The day-to-day readiness levels of China's nuclear forces are presently low. The DF-5A and DF-4 are not mobile and require significant launch preparation time. These missiles also do not have mated warheads. This situation is expected to change with the introduction of the DF-31 and DF-41, both of which will have significantly decreased launch preparation times and potentially mated warheads.

The open sources disagree on China's current MIRV capabilities. One source claims that at least four DF-5s have already been MIRVed.¹⁰¹ However, most support the claim that no DF-5s have been fitted with MIRV warheads, but that MIRVing will occur in the near future on the DF-31 and DF-41. Some believe China will not pursue MIRV capabilities because they have too few nuclear warheads for counterforce strikes.¹⁰²

China has gone to great lengths to secure and camouflage its missile force. There are an estimated 10-18 silos with DF-5 missiles that were "improved" in 1994, but the nature of the silo improvements was not described in open sources. China also rebuilt a number of false shell-wells at the same time, presumably as dummy silos.¹⁰³

In 1995, Chinese media announced the completion of the Great Wall Project. The report claimed that "tens of thousands" of army engineers built tunnels through a North China mountain range over a 10-year period in an effort to harden China's missile storage and launch sites. Analysts believe the range to be the Tai-Hang, located 400 km southwest of Beijing between Hebei and Shanxi. One estimate calculates a network of tunnels up to 5,000 km long. This project indicates that China has plans to put much of its strategic missile forces underground in a tunnel system where, according to one analyst, they would be invulnerable to a preemptive strike, but from which could easily be moved to launch positions in surrounding gorges.¹⁰⁴ China has also abruptly canceled mining contracts with Western firms for selected minerals in the Yunnan and Hunan provinces leading some analysts to conclude that China is converting underground mines to missile launch sites.¹⁰⁵

¹⁰¹ David Tanks, "Chapter 3: China and Northeast Asian Powers: The Great Challenge of Tomorrow," *Exploring U.S. Missile Defense Requirements in 2010: What are the Policy and Technology Challenges* (Washington, D.C.: Institute for Foreign Policy Analysis, 1997). Internet: <http://www.ifpa.org/pubs/2010/2010toc.htm>.

¹⁰² Charles Ferguson, "Sparking a Buildup: U.S. Missile Defense and China's Nuclear Arsenal," *Arms Control Today*, March 2000. Internet: http://www.armscontrol.org/act/2000_03/cfmr00.asp - backtab1.

¹⁰³ Markov, David R. and Andrew W. Hull, "The Changing Nature of Chinese Nuclear Strategy," Institute for Defense Analyses, January 1997, p. 18.

¹⁰⁴ Tanks, *op. cit.*

¹⁰⁵ Information in this paragraph was derived from Tanks, 1997. According to Tanks, China makes considerable efforts to conceal missile capabilities beyond hardening sites. It uses dummy sites, hides missiles in civil buildings

The PLA's strategic bomber force is considered the weakest leg of the Chinese triad. Currently, China possesses about 100 Hong (B-6/Badger) and 30 Qian-5 (A-5/FANTAN) bombers. These 30-year old bombers, when faced with modern day air defenses, do not constitute a credible retaliatory force.¹⁰⁶ China has been developing a new supersonic, modern, all-weather bomber, the J-H-7 (or B-7), at the Xian Aircraft company. Problems with the engines have resulted in only a few dozen being deployed to the Chinese Navy. Currently, this aircraft is not believed to have a nuclear mission.¹⁰⁷

China's naval nuclear force currently has only one SSBN, the *Xia*- class submarine (Type 092).¹⁰⁸ China's naval nuclear force aims to be composed of four to six new Type 094 nuclear submarines expected to begin production between 2003-2005. They will mount 16 JL-2 nuclear-tipped missiles and incorporate significant amounts of Western and Russian technology.¹⁰⁹ The Type 094 is expected to be a great improvement over the Type 092, which was plagued with technical failures and poor engineering.

Nuclear capability projections in the open source community cover a wide range of potential developments. A more alarmist view claims that by 2010, China plans to have 75-80% of its ballistic missiles capable of targeting the US and Russia and that China has the capability of expanding its nuclear inventory to 3,000-5,000 nuclear weapons in the same timeframe, although its actual weapons objective is thought to be much lower.¹¹⁰ According to one view, China's future nuclear force will be made up of three categories: strategic, theater, and tactical systems. The strategic force will consist of DF-41s and JL-2 (on 3-4 ballistic missile submarines or SSBNs). The theater force will use DF-31s, cruise missiles (Russian RK-55s and indigenous models), and 150-160 Su-27 Flankers and Tu-22 M Backfires. The tactical force will experience the most growth with 200 FC-1/J-10 multi-role fighters, 50-100 J-811 multi-role fighters, nuclear torpedoes, and nuclear artillery projectiles.¹¹¹

with removable roofs, places missiles in mines, caves and tunnels, and has even considered deploying DF-5s inside fake bridge towers and railway cars.

¹⁰⁶ Saunders and Jing-dong Yuan, *op. cit.*, p. 3

¹⁰⁷ NRDC: Nuclear Data – Table of Chinese Nuclear Forces, 2002.

¹⁰⁸ Saunders and Yuan. *op. cit.*, p. 3

¹⁰⁹ Tanks, *op. cit.*

¹¹⁰ *Ibid.*

¹¹¹ Markov and Hull, *op. cit.*, p. 20.

TABLE I-1: Open Source Summaries of Chinese Nuclear Weapons Systems

Type	Designation	Description	Range	Payload	Yield	Deployed	Year Deployed
ICBM	DF*5/DF-5A (CSS***-4)	<ul style="list-style-type: none"> • 2-stage • storable liquid propellant (N204/UDMG) • gyro-platform with onboard computer • 30-60 minute launch preparation time 	13,000+ km	3,200 kg	1 x 4-5 mt	~20	1981
ICBM	DF-31 (CSS-X-9)	<ul style="list-style-type: none"> • 3-stage • solid propellant • possible MRV/MIRV capability • tested and under development with its warhead awaiting certification • same missile as the JL-2 	8,000 km	700 kg	1 x 200-300 kt	0	Possible 2002
ICBM	DF-41 (CSS-X-10)	<ul style="list-style-type: none"> • 3-stage • solid propellant • possible MRV/MIRV capability • under development • expect 3-5 minute launch preparation time 	12,000 km	800 kg	1 x 200-300 kt	0	(Believed to have been cancelled)
SLBM	JL**-1 (CSS-N-3)	<ul style="list-style-type: none"> • 2-stage • solid propellant • gyro-platform inertial guidance with onboard computer • Same missile as the DF-21/DF-21A 	1,700 km	600 kg	1 x 200-300 kt	12	1986
SLBM	JL-2 (CSS-NX-5)	<ul style="list-style-type: none"> • 3-stage • solid propellant • possible MRV/MIRV-capable • tested and under development with its warhead awaiting certification • same missile as the DF-31 • “X” connotes experimental 	8,000 km	700 kg	1 x 200-300 kt	0	Possible 2005

TABLE I-1: Open Source Summaries of Chinese Nuclear Weapons Systems (cont'd)

Type	Designation	Description	Range	Payload	Yield	Deployed	Year Deployed
MRBM	DF-2 (CSS-1)	<ul style="list-style-type: none"> recently taken out of service 	1,250 km				
MRBM	DF-3/DF3-A (CSS-2)	<ul style="list-style-type: none"> 1-stage storable liquid propellant (AK27/UDMH) fully inertial strap-down guidance system 120-150 minute launch preparation time 	2,800 km	2,150 kg	1 x 1-5 MT	40+	1971
MRBM	DF-4 (CSS-3)	<ul style="list-style-type: none"> 2-stage non-storable liquid propellant 60-120 minute launch preparation time 	4,750 km	2,200kg	1 x 1-5 MT	10+	1980
MRBM	DF-21/DF21-A (CSS-5)	<ul style="list-style-type: none"> 2-stage solid propellant gyro-platform inertial guidance with onboard computer Same missile as the DF-21/DF-21A 	1,800 km	800 kg	1 x 200-300 kt	10-50	1986
SRBM	DF-11/M-11 (CSS-7)	<ul style="list-style-type: none"> 2-stage solid propellant strap-down inertial computer digitized guidance system with terminal control 30-45 minute launch preparation time M-11 version designed explicitly for export possible 	300 km	800 kg	1 x 350 kt	40+	1995
SRBM	DF-15/M-9 (CSS-6)	<ul style="list-style-type: none"> 1-stage solid propellant strap-down inertial computer digitized guidance system with terminal control trying to enhance accuracy with GPS technology 30-minute launch prep. time M-9 version designed explicitly for export 	600 km	950 kg	1 x 50-350 kt	200+	1995
Aircraft****	Hong-6 (B-6)	“Badger Type”	3,100 km		1-3 x bomb	100	1965
Aircraft	Quian-5 (A-5 Fantan)		400 km		1 x bomb	330	1970

*DF-Dong Feng, **JL – Julang, ***CSS-US designation, **** Figures for bomber aircraft are for nuclear configured versions only. Aircraft range is equivalent to combat radius. Assumes 150 bombs for force, with yields estimated between 10 kt and 3 Mt.

Sources: Cordesman 2001; IISS 1999, table 53; Jane's Strategic Weapons Systems 1998; CNS 1999; US DoD 2001.; Ellis and Koca, “China Rising: New Challenges to the U.S. Security Posture”, 2000; NRDC: Nuclear Data – Table of Chinese Nuclear Forces.

II. Ballistic Missile Bases and Targeting

Table I-2 provides an open source summary of Chinese missile base locations as well as their likely targets.

Table I-2: Open Source Summary of China Ballistic Missile Bases and Targeting Information

Base	Location	Brigades	Missiles	Target
51	Shenyang, Jilin	Tonghua (DF-3A and DF-21), Dengsha (DF-3A)	DF-3A (CSS-2) DF-21 (CSS-5)	Northeast Asia
52	Huangshan, Anhui	Leping (DF-15), Lianxiwang (DF-3A), Yongan (DF-11A), Xianyou (DF-11A)	DF-15 (CSS-6) DF-3A (CSS-2) DF-11A (CSS-7)	Taiwan
53	Kunming, Yunnan	Chuxiong (DF-21), Jianshui (DF-3A)	DF-3A (CSS-2) DF-21 (CSS-5)	Southeast Asia/India
54	Luoyang, Henan	Luoning (DF-5). Sundian (DF-4)	DF-4 (CSS-3) DF-5 (CSS-4)	Russia/US
55	Huaihua, Hunan	Tongdai (2 brigades of DF-4)	DF-4	Russia
56	Xining, Qinghai	Datong (DF-3A), Delingha (DF-4), Da Qaidam (DF-4), Liujihou (DF-3A)	DF-3A (CSS-2) DF-4 (CSS-3)	Russia, India

Source: The Henry L. Stimson Center, 1998; Bates Gill, James Mulvenon, and Mark Stokes. “The Chinese Second Artillery: Transition to a Credible Deterrence.”

III. Nuclear Command and Control (C2)

China’s nuclear forces are maintained by the PLA Second Artillery Corps. This Corps consists of 90,000 troops organized by headquarters:

- Early Warning System Division;
- Communication Regiment;
- Security Regiment;
- Technical Support Regiment; and,
- 6 Ballistic Missile Divisions.

The Second Artillery Corps is under the operational control of the PLA General Staff, but *de facto* control is exercised directly by the CMC.¹¹² The 2000 defense white paper, for example, puts the nuclear force under the command of the CMC. As a completely separate branch of the Chinese military, The Second Artillery maintains its own command and lines of

¹¹² Tanks, *op. cit.*

communication with its bases and does not need to pass information through the regional military commands.¹¹³

The independence of the Second Artillery Corps in order to ensure the central leadership's control over China's nuclear assets is a long-embedded tradition in China. As early as 1970, U.S. analysts noted

The party leadership has apparently been careful in its dispersal of nuclear weapons within the military, and what is known of Peking's nuclear strategy points to the establishment of an independent organization of the strategic forces facilitating the central leadership's undisputed control over nuclear assets.¹¹⁴

At least two hardened C2 bunkers have been identified in open sources. The primary underground command facility used by the CMC is located under Yuquan Shan Mountain in the Western Hills outside Beijing. This facility is the central command and control center for all Chinese forces, including the Second Artillery.¹¹⁵ A second national military command bunker is reportedly located at Hohhot, north of Beijing near the border with Mongolia. At least 8 very-low frequency (VLF) transmitters are identified throughout China, enabling communications with China's current and future ballistic missile submarines. An integral part of China's missile warning and space tracking network includes large phased array radars (LPAR). At least one LPAR has been identified at Xuanhua, and is believed to be manned by Second Artillery forces. China has also deployed an Over-the-Horizon Backscatter Radar [OTH-B] to provide surveillance of the South China Sea. However, the location of this facility remains unclear.¹¹⁶

China's C2 structure has a variety of weaknesses including deficiencies in early warning systems, limited communications, and poor mobility and dispersal capabilities.¹¹⁷ PLA strategists acknowledge that the Strategic Missile Force Command "is deficient in targeting intelligence, and lacks more complete 'firepower plans' that specify targets and the deployments and sequencing of weapons to be used in a counter-attack, among other weaknesses."¹¹⁸

According to one Indian analyst, China does not have the command, control, communications and intelligence (C3I) capabilities for commanding limited war-fighting operations. It lacks the technical ability to detect an incoming first strike and "launch on tactical warning."¹¹⁹ China needs to improve in three areas: early warning satellites, reconnaissance satellites (an imaging satellite was last launched in 2000), and telecommunications systems. China is currently in the market to acquire improved nuclear detection satellites.¹²⁰

¹¹³ Nuclear Threat Initiative, "China Profile: Second Artillery Corps." Internet: <http://www.nti.org/db/china/sac.htm>

¹¹⁴ U.S. Congressional Research Service, "Authority to Order the Use of Nuclear Weapons (United States, United Kingdom, France, Soviet Union, People's Republic of China)," U.S. Government Printing Office, 1975.

¹¹⁵ Bates Gill, James Mulvenon, and Mark Stokes, "The Chinese Second Artillery Corp: Transition to Credible Deterrence," in James C. Mulvenon and Andrew N.D. Yang, eds, *The People's Liberation Army as an Organization*, Reference Volume 1, p. 546. Internet: <http://www.rand.org/publications/CF/CF182/>

¹¹⁶ Information in this paragraph has been derived from the Federation of American Scientists web site: <http://www.fas.org/nuke/guide/china/facility/c3i.htm>.

¹¹⁷ Saunders and Yuan, *op. cit.* Internet: http://www.cns.miis.edu/cns/projects/eanp/conf/op4_sjd.pdf.

¹¹⁸ Alastair Iain Johnston *op. cit.*

¹¹⁹ Pande, *op. cit.*

¹²⁰ Markov and Hull, *op. cit.*, p. 13.

China's nuclear warheads are not secured by permissive-action-link (PAL) devices. However, China does follow other procedures such as two-man launch and keeping warheads separated from missiles. These measures are based on political control of the weapons and are not guaranteed in times of political instability.¹²¹ Control risks could increase as warheads become mated to missiles in the new generation of weaponry.

In the 1980s, China conducted efforts to train the strategic missile forces to launch under simulated nuclear war conditions.¹²² During the mid 1990s the Second Artillery Corps trained in simulated chemical-biological warfare environments.¹²³ It is also claimed that recently, the Second Artillery Corps may have held antimissile exercises.¹²⁴

The Second Artillery practices sequential missile launches from different bases or "group launches" in order to test and increase the speed of its response and retaliatory capabilities. The group launch tactic has been seen in Second Artillery training for Sino-Soviet war scenarios and also during the missile firings near Taiwan in 1995 and 1996. In addition, Second Artillery Units frequently practice mobile launches and work to shorten pre-launch times.¹²⁵

In terms of China's modeling of nuclear exchanges with the US, China ascribes high capabilities to US Navy lower tier and theater-wide missile defense systems. Chinese planners envision a network of radar and C2 systems in which a variety of TMD systems forward-deployed in Asia provide a capability amounting to boost-phase intercept of Chinese strategic nuclear forces.¹²⁶

¹²¹ Tanks, *op. cit.*

¹²² Pande, *op. cit.*

¹²³ Nuclear Threat Initiative, *op. cit.*

¹²⁴ *Ibid.*

¹²⁵ *Ibid.*

¹²⁶ Michael Nacht and Tom Woodrow, "Strategic Trends in China: Session 6: Nuclear Issues," *Global Beat*, June 1998. Internet: <http://www.nyu.edu/globalbeat/nuclear/nacht0698.html>

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DETERRENCE AT LOW LEVELS OF NUCLEAR WEAPONS: A REAPPRAISAL

BRITISH AND FRENCH EXPERTS' MEETING

*International Institute for Strategic Studies, London
November 20, 2002*

Workshop Summary

Michèle Ledgerwood, Rapporteur

This summary is non-attributive. For clarification purposes, the nationality of expert participants is indicated where relevant.

Welcome and Opening Remarks

This seminar is not an academic exercise; rather, it is intended to bring the expert opinions of our European colleagues to bear directly upon the current thinking in Washington. The background for this meeting is the implementation of the Nuclear Posture Review (NPR), and the impact of minimal deterrence issues as the United States reduces its strategic arsenal. The specific goals of this workshop are to:

- Consult with European colleagues and hear their views on deterrence, because such inputs are important and do not frequently find their way into the U.S. debate;
- Develop a better understanding of the contributions made by the U.K. and France within the new NPR framework;
- Understand the implications of minimum deterrence for nascent nuclear powers and for the behavior of "rogue" states; and
- Use these findings to influence the current thinking in Washington.

The Origins and Evolution of Nuclear Strategy in the United Kingdom and France

The United Kingdom – Themes from the Deterrence Literature
Presented by a United States Nuclear Expert

There is a rich and growing literature on Britain's nuclear deterrent. Several themes are emerging from an ongoing survey of this body of work. Overall, the literature indicates that the United Kingdom's nuclear deterrent has been shaped by a confluence of reinforcing political, economic, and technical factors, many of which endure to this day.

Three primary political factors emerge from the literature: Britain's role as an "atomic pioneer"; the importance of Anglo-American relations; and the perceived Soviet threat. In many respects, Britain was an atomic pioneer. This encompassed not only her lead in scientific research but also in the early conceptualization of nuclear deterrence. Britain recognized early on that the potential of atomic weapons could fundamentally alter the course of the war or reverse its outcome if Germany got hold of them either during or after the conflict. This

realization gave great impetus to Britain's efforts to develop a fission bomb, first on its own, and later in collaboration with the United States. Irrespective of the German threat, Britain concluded that no country could afford to be without the atomic bomb. Britain was perhaps the first to recognize that there was no defense against atomic bombs, other than to retaliate in kind. The realization that other countries would seek atomic bombs and that there was no defense against such weapons except through the threat of retaliation became the foundation of nuclear deterrence. This initial British thinking about the nature and importance of nuclear weapons and nuclear deterrence has been sustained by an overall domestic political consensus for over a half-century, with relatively minor differences between Labor and Conservative governments.

Britain's nuclear deterrent was always very closely tied in with that of the United States. In a sense, atomic weapons both mark and facilitate the shift in global power from Britain to the United States. Consequently, Britain believed that it "needed" nuclear weapons to retain great power status and to have influence over U.S. policymaking. Britain also wanted nuclear weapons to hedge against U.S. "neoisolationism" or nuclear adventurism. The U.K. therefore adopted a strategy of *atomic entanglement* to keep the United States tied to the security of post-war Europe, and to seek to have a say in the U.S. use of nuclear weapons. It has been said that the way to be consulted is to make consultation necessary. Nuclear weapons collaboration became the route by which Britain sought to influence U.S. nuclear policy. As evidenced by the Hyde Park and Quebec Agreements, the Truman-Attlee discussions over possible U.S. nuclear use in the Korean War, and the conclusion of the 1963 Partial Test Ban Treaty, the United Kingdom has had some success in this regard.

Many British interests were sublimated to achievement of this goal of close nuclear collaboration with the United States, such as start-up of its own atom bomb program, access to fissile material, achieving a truly independent nuclear deterrent, and entry into the European Common Market. Moreover, the desire for close nuclear cooperation has not always been mutual. Early post-war constraints imposed by the United States on sharing nuclear weapons technology increased the costs to Britain of attaining its own atomic bomb. Over time, however, the Anglo-American nuclear relationship evolved into a full spectrum of collaboration.

British interest in nuclear deterrence was sustained by the emergence of the Soviet Union as both a military and political threat to Europe. The British Chiefs of Staff recognized the USSR as Britain's likely rival as early as 1944, but it was not officially permitted to name the Soviet Union as the enemy until early 1948. In the early-1950s, Britain recognized that the USSR was not likely to deliberately initiate a war, and that a longer, "Cold War" lay ahead. The United Kingdom was quick to grasp, however, that the emergence of "equipoise" or mutual vulnerability to nuclear attack between the United States and the Soviet Union would undermine the credibility of the U.S. nuclear guarantee to Britain and NATO. With the collapse of the Soviet Union, there has been room for reconsideration and adjustment in Britain's nuclear posture.

Economic factors have been central in shaping British nuclear strategy. To begin, the strains of Britain's wartime economy were such that the lead in atomic weapons research was ceded to the United States. This was a crucial turning point in British history. We can only

speculate how Britain's international role might have differed if she had gotten to the bomb first, and on her own.

In the post-war period, the conventional rearmament program for the Korean War further extended the U.K.'s military burden. In time, atomic and thermonuclear weapons are seen as a means of scaling back on Britain's conventional forces. This economic factor was boosted by early doctrinal thinking about the future of war, which speculated that future war would likely be short and fought mainly with nuclear weapons. As the economic demands of maintaining a credible deterrent became apparent with the obsolescence of the V-bombers and the development of the Chevaline program, the incentive to maintain nuclear cooperation with the United States was reinforced.

Technical factors also played a role in shaping British nuclear thinking in the early years. The H-bomb was quickly seized upon by Britain as a means of leveling the deterrence playing field, making it easier to deter the much larger Soviet Union. Britain also recognized that beyond achieving a certain level of destruction, additional nuclear weapons were superfluous. This led directly to the concept of "nuclear sufficiency".

Nonetheless, increases in Soviet theater nuclear forces posed great challenges on Britain in terms of ensuring the survivability of its smaller nuclear forces. Britain's limited technical and resource base increasingly drove it to closer cooperation with the United States on more survivable nuclear delivery systems, particularly the submarine-launched ballistic missile. Because access to U.S. nuclear technology and materials was contingent on Britain's own progress in the field (e.g., thermonuclear weapons, re-entry vehicles), something of a self-perpetuating loop of technical cooperation was created. Britain's development of more advanced nuclear weapons was not driven solely by technical factors, however. Publicly, it was asserted by Winston Churchill that in order to retain its influence in the world, Britain needed to possess the most advanced nuclear weapons.

Britain's nuclear strategy is the result of the interplay among these political, economic, and technical factors. That strategy appears not to be premised on existential deterrence or on warfighting. Rather, British nuclear strategy is aimed at preventing conventional and nuclear war primarily via the threat of nuclear retaliation. Ensuring the credibility of the British nuclear threat thus was paramount, and was reflected in the various measures developed to ensure the pre-launch survivability of the V-bombers. Britain did leave the door open to first use of tactical nuclear weapons but largely for political signaling purposes.

British nuclear strategy was focused primarily on Europe, although it extended to the Middle East and East Asia through the 1960s, with the deployment of British nuclear weapons to Cyprus and Singapore. The British nuclear force was characterized variously as a "contribution to the Western deterrent", a "second center" of nuclear decisionmaking in NATO (thereby complicating Soviet planning), and an "independent" deterrent in the event Britain had to face the Soviet Union alone. These multiple rationales have complicated British nuclear planning as well as Anglo-American relations.

With respect to targeting, the United Kingdom made pioneering efforts to assess the level of "unacceptable damage", but publicly, targeting policy remained vague. Britain's initially considered both urban and industrial targeting of the Soviet Union. It then shifted to a counterforce posture (1950-55). With the growth of Soviet theater nuclear forces, however, Britain fell back on counter-value targeting, with some refinements over the years. The literature suggests that as little as 5-15 Soviet cities were targeted at any given time, apparently with Moscow consistently in the "bull's eye."

British nuclear policy revisions in 1993 and 1998 acknowledged the profound geopolitical changes of the post-Cold War period. These reviews led to the scaling back of the level and types of nuclear weapons to fewer than 200 operationally available nuclear warheads. The strategic emphasis shifted from deterring Soviet aggression to "hedging" against uncertainty in the international system, whilst also recognizing the threat of proliferation.

Barring any major shocks, this new stasis in British nuclear deterrence posture appears likely to hold for many years to come, with no major decisions on the horizon until the replacement of the Trident system, sometime around 2012.

Response to Presentation on British Nuclear Deterrence

Presented by a British Nuclear Expert

Nuclear entanglement with the United States has been critical to U.K. policy since the 1940s. It has saved the U.K. a great deal of money to be reliant on a U.S.-supplied delivery system since the late-1960s. British policy also has been partly driven by nuclear weapons as a means of influence on American policy during times of crisis. In this respect, our approach has differed from the French "hard man" approach, but it has been very useful to us to have the French presence on the UN Security Council as the dissenter. The British policy of nuclear entanglement with the U.S. also has an operationally important, built-in "independence caveat"; if a nuclear crisis occurred tomorrow, the British government could claim that it could use its nuclear weapons without the cooperation of the U.S. In reality, if the U.S. withdrew its support, the U.K. nuclear capability and operational independence would erode, although this process of attrition would take many years.

With respect to the domestic political consensus, there has been a general consensus between successive governments, but it is misleading to suggest that there has been consensus *within* governments, or between political parties. Domestic public opinion has been more divided than a political consensus would suggest. Peaks of domestic opposition have coincided with high levels of cost and with periods of heightened international tension (which have spurred anti-nuclear sentiment) – e.g. in the late 1950s and early 1960s; and in the late 1970s and early 1980s. Domestic opposition generally has been intensified by the relationship with the United States, which has provoked the argument that the U.K. arsenal was redundant and therefore superfluous; some experts have suggested that a replacement for the Trident was unnecessary. The traditional anti-nuclear case has been strengthened because of U.K. dependency on the U.S.; this dependency raises questions about the price being paid in terms of independence in British foreign policy in exchange for U.S. nuclear assistance. The notion of a "truly independent nuclear deterrent" has therefore been politically paramount in British nuclear strategic thinking.

In terms of strategy, the U.K. argument about a "second center" stems primarily from the belief that an adversary might be more unlikely to use nuclear weapons if it were facing two nuclear-armed adversaries. Nuclear weapons ensured that the U.K. was perceived as "strategic territory". In some Cold War circumstances, those weapons might have bought the U.K. some type of sanctuary.

In terms of targeting, the key with respect to having Moscow as a target is the notion of holding at risk the key elements of Soviet state power. This is distinct from "city-busting". The U.K. always has been mindful of international legal limits on targeting civilians. The number of targeted cities has varied considerably over the years.

There are some interesting twists in the 1998 U.K. Strategic Defense Review, including having only one boat on patrol and putting weapons on one day's notice to fire. What the changes actually mean, essentially, is a reduced level of alert. It is interesting to note that the U.K. is now the smallest of the nuclear states, because it relies on a single delivery system. It accepts the risks inherent in that posture, which continues to reinforce the argument for linkages with the U.S.

France – Themes from the Deterrence Literature
Presented by a United States Nuclear Expert

France is a somewhat remarkable case in that its nuclear deterrence strategy and doctrine have remained very consistent throughout the past half century. France's nuclear doctrine was and remains one of strict deterrence and continues to form the basis of overall French national defense strategies. Forces are maintained at a level of strict sufficiency. The motivations for France's nuclear posture have been primarily political in nature, and the constraints have been primarily economic. The only changes in strategy throughout the years have been in the areas of targeting, and in the relevance of certain doctrinal elements in the absence of a "great power" adversary in the post-Cold War period.

The economic factors governing France's nuclear deterrence doctrine and posture are not commonly cited in the early literature, where political factors dominate the French outlook. Two economic influences do emerge: the first was the need, in the late-1940s and early-1950s, to redress the French post-war energy deficit through the use of nuclear energy. The French understood the potential of nuclear energy; as research progressed, the military applications of nuclear energy were not lost on either the government or the scientific community, and gradually became the focus of research efforts in the early years, following the establishment of the Commissariat à l'Énergie Atomique (CEA), which bridged the civil, scientific, and military domains. Nuclear energy did not emerge as a true pillar of the French economy until the mid-1960s; however, the predictions of early researchers have held true, and nuclear energy remains significant in the French economy today, accounting for 80% of electricity production. The second economic influence on France's deterrent posture stemmed from the fact that, in contrast to the U.K., it sought to avoid "entanglement" with the United States and thus received no direct support. This was a critical factor in establishing its strategy of "strict sufficiency".

Political factors were paramount in shaping France's deterrent doctrine and strategy. It is important to understand that for Charles de Gaulle and those who came after him, the "force de frappe" was a *political asset* rather than a strategic weapon system. The prominence of political motivations also helps explain the relative political consensus enjoyed by France's nuclear doctrine. The Communist Party maintained a strict non-proliferation stance, but included scientists such as Joliot-Curie, who were atomic pioneers. Three main political drivers provided the impetus for the development of a French nuclear arsenal and the establishment of French nuclear doctrine: first, the need to restore the French position in world affairs; second, the desire to protect French vital interests at home and abroad; and third, the belief that French decisionmaking must remain independent from the United States' and NATO's.

- *Restoring French "prestige"*: the French suffered both the stigma of defeat and severe economic consequences in two consecutive world wars and again in Indochina, with the battle of Dien Bien Phu (1953). The withdrawal of U.S. support in the Suez Crisis of 1956 further weakened France, and strengthened its resolve to reestablish itself as a credible world player. In a European context, the desire to restore national pride included the specific strategic goal of trumping Germany.
- *Protecting French "vital interests"*: these were defined as the "national sanctuary and territorial integrity" both in France and in its interests abroad. In this regard, Charles de Gaulle never perceived NATO guarantees as reliable. This was compounded by the American reaction to the Suez Crisis in 1956, which branded the United States as an "unreliable ally" and, in turn, suggested that U.S. nuclear protection also could not be depended upon. Like the U.K., France perceived that in the post-war era, no country should be without a nuclear capability of its own.
- *Independence*: this third political factor goes hand in hand with the previous two. France was anxious to maintain political independence from the United States and NATO, not only to assert itself as a fully capable world player, but also to avoid getting drawn into American conflicts and another all-out war (as in Korea). The debate between France and NATO culminated with de Gaulle's withdrawal of France from NATO's Integrated Command structure in 1966. It is important to note that France posited its nuclear strategy not only as independent from NATO's, but also as *doctrinally distinct* from the United States', particularly in asserting the purely deterrent quality of its forces. France had been involved in the Manhattan Project through the participation of Bertrand Goldschmidt, who worked with Enrico Fermi; as a result, the French understood the motivations behind the American nuclear force posture very well.

France's nuclear strategy also was developed in reaction to certain specific perceived threats: a fear of German resurgence; the Soviet thermonuclear explosion of 1953; and the sense of a "sudden and constant danger" posed by the threat of a nuclear attack from abroad. From the 1960s onward, the USSR was perceived as the main threat to French interests, although it is interesting to note that, in contrast to the United States and Great Britain, official French documents never named the USSR as the actual threat until the 1980s.

The technical factors governing French nuclear posture dovetailed with the economic and political influences cited previously. France was a leading nation in nuclear physics and fission research prior to the Second World War, and although it lagged afterwards, it always appreciated the potency and potential of nuclear weapons. The technical notion driving French doctrine was that nuclear weapons are inherently powerful enough that only a small force is needed to provide a credible deterrent.

French doctrine stipulated that a nuclear strike was not an extension of conventional war. French nuclear delivery systems were developed officially for the defense of French territory; the purely defensive nature of the deterrent dictated France's force posture. The centerpiece of French nuclear doctrine, first articulated by Général Pierre Gallois, was "la dissuasion du faible au fort" (literally, deterrence of the strong by the weak, often translated as "proportional deterrence"). Général Charles Ailleret extended this doctrine to include the concept of "la défense tous azimuts" (omnidirectional defense), which suggested that the flexibility of French response to global threats was guaranteed by independent nuclear capabilities that had a "worldwide scope". While the reach of the French arsenal never became truly global, the concepts of flexibility and omnidirectionality persist and are arguably even more important today than they were in the 1960s. Later additions to the French nuclear arsenal – nuclear bombers, ballistic missile submarines, IRBMs – were added to provide credibility to the French deterrent.

Deterrence of the strong by the weak is predicated upon three main preconditions: first, that the French deterrent is both credible and survivable; second, that French vital interests are perceived to be at stake; and third, that command and control structures are adequate, namely, that the French leadership is willing to use nuclear weapons. These criteria are less relevant in the post-Cold War world and are largely absent from the more recent literature, including the 1994 Defense White Paper. The French deterrent continues to be purely defensive; the French reject the notion of nuclear warfighting and believe that the U.S. preemptive strategy undermines both deterrence and nonproliferation goals.

France has generally espoused a no first use policy. However, French doctrine has consistently clarified a caveat allowing first use under "prestrategic" conditions. A prestrategic use of nuclear weapons would consist of a single, unique attack, to serve as the "ultimate warning" when the threat to French interests was perceived as allowing no other solution. The prestrategic clause is the only scenario that envisages the use of tactical nuclear weapons by France, and also is the only example of counterforce targeting in the publicly available literature. The term "prestrategic" was first used in 1984; prior to that, the concept was known as "tactical warning". Today, the term "prestrategic" is no longer used, but the concept of providing an "ultimate warning" still forms a cornerstone of French nuclear strategy.

With the exception of the special case noted previously, French targeting objectives have consistently been countervalue ("anti-city"), not counterforce. In French nuclear doctrine, the value of a target stems from the infliction of damage that is both unacceptable to the enemy and repeatable. Targets are selected because their destruction causes damage to the enemy's "economy, society, and infrastructure". These criteria, articulated in the early literature, suggest that the "force de frappe" presented an effective and sufficient deterrent even under de Gaulle. As mentioned previously, in the 1950s, 1960s, and 1970s, although it was clear that the Soviet

Union presented the only real threat to France, it was never actually publicly named as the enemy (in contrast to the rhetoric in the U.S. and U.K.). Deterrence and targeting objectives simply alluded to an "adversary" or a "great power". The USSR and Moscow were named explicitly for the first time in the late 1970s and throughout the 1980s, which marked a noteworthy change in the public communication of the French deterrent.

Today, discussion of targeting focuses more on the strategy of flexible response; the doctrine of "défense tous azimuts" has increased in relevance. Public opinion and popular sentiment are factored into the decisionmaking on French targeting, and the result is a greater selectivity and discrimination in target selection. Weapons are designed to provide flexibility, precision, and controlled effects. The public literature suggests potential targets both in the "East" and the "South", and countries such as Iran, Iraq, Libya, and Algeria are named in the academic analytical literature. It should be noted that in 1996, all French nuclear weapons were officially detargeted.

Lastly, there has been quite a bit of discussion in France about the possibility of a European deterrent. While the French have been the strongest European proponents of this option, serious discussions at the E.U. level have never truly progressed. President François Mitterrand and Prime Minister Alain Juppé submitted a formal proposal for "Concerted Deterrence" at the European level in 1995, but this proposal was widely dismissed as disingenuous as it coincided with the resumption of French nuclear testing. France has pursued independent discussions at different times with the U.K. and Germany, but again, these have never produced any clear plans for future collaboration.

Response to Presentation on French Nuclear Deterrence

Presented by a French Nuclear Expert, with commentary from other French Experts

There are several noticeable differences between France and the U.K.:

- First, France has been perceived as a model to emulate by other countries. Many of the original texts published by Général Gallois figure prominently in Iraqi libraries and are referenced in Iraqi literature, for example.
- Second, the French decision to acquire nuclear weapons was aimed specifically at establishing strategic independence from the United States, whereas the U.K. decision was aimed at gaining influence upon the U.S. The technical and political implications for the U.K. were significant, and driven also by the fact that British scientists had played a much greater role than French scientists in the Manhattan Project. In France, Charles de Gaulle always had difficult relations with American presidents, which caused an enduring and mutual lack of trust that colored discussions of major strategic issues.
- Third, there is a paradox in the "second center of decision" element of the U.K. doctrine: it is actually far more applicable to French strategy than to U.K. strategy because of the French emphasis on the independence of their nuclear arsenal. At the same time, France has never invoked a "second center" argument. The French belief has simply been that if you make yourself a critical player, you will be consulted.

It is futile to debate which country had the greatest *actual* degree of independence. However, it should be noted that the styles of independence were different. The French conception emphasized independence of procurement and independence of decisionmaking. The U.K. conception, on the other hand, focused on operational independence.

1956 was an important year for French nuclear doctrine and strategy. France was at the point where a country like Iran is now: it had the ingredients for a nuclear program, but not the program itself. Général Charles de Gaulle was a critical driver in establishing a French nuclear presence. It was de Gaulle who made the decision to test in 1958. And without the personality of de Gaulle, France would have remained where India did in 1974 – conducting a test, but not progressing any further. Important decisions were taken by de Gaulle in 1958 that otherwise might not have been made, specifically: the establishment of an operational deterrent; and the *independence* of this deterrent, a concept that was not self-evident at the time.

In terms of key rationales behind the French decision to acquire nuclear weapons, "prestige" ranks quite low on the list. "Prestige" is a misnomer, commonly the result of mistranslations or bias in the English-language literature on French nuclear doctrine, or the product of more revisionist modern French writings on the origins of nuclear deterrence. The key rationales were (1) security; (2) political; and (3) to a much lesser extent, domestic. The first two rationales, not surprisingly, were largely intertwined.

- *Security*: The importance of guaranteeing French security was a clear legacy of World War II; the French had no desire to relive the defeat of 1940. In addition, it was clear to de Gaulle and his military advisors that France would need to *ensure its own security*. De Gaulle had initially been overlooked by the Americans in 1942 in favor of Général Giraud, and had become the national (vs. American-backed) candidate to lead French forces in the liberation of France; de Gaulle's tactics and foresight had proven far superior to Giraud's, and he had no desire to see his instincts undermined again. The discussion of using U.S. nuclear weapons following the French defeat at Dien Bien Phu also convinced de Gaulle of the need for a French capability that was immune from U.S. policy. The Suez Crisis of 1956 and the perceived betrayal of the U.S. were *critical* in reinforcing the need for an independent French force and doctrine. The French felt the proximity of the Soviet Union acutely – the USSR was only "à deux étapes du Tour de France" ("only as far away as two legs in the Tour de France cycling race") – and did not trust the United States to provide a sufficient security guarantee against that threat.
- *Political*: Again, the legacy of 1940 and of Suez were paramount; the latter in particular demonstrated the limitations of French sovereignty. De Gaulle felt that it was critical to have the ability to independently defend French interests. This fit in with his larger agenda of transforming France's role internationally. The move to establish an independent French nuclear force in the late-1950s, and the later withdrawal from NATO's Integrated Command in 1966 were two sides of the same coin. France's view that nuclear deterrence had "no friend at all" dated back to the 1940s and had a profound impact on the technical and operational organization of its nuclear program.

- *Domestic:* The premise here was largely that nuclear weapons provided the ultimate means of civilian control over the military. This need for better control over the military became apparent with the troubles in Algeria (then a French colony) in the 1960s: first, with the establishment of the Organisation de l'Armée Secrète (OAS) – a French right-wing terrorist group formed in 1961 in opposition to potential Algerian independence – which conducted numerous terrorist attacks including an attempted assassination of de Gaulle in 1962; and the military-staged coup in Algeria in 1968.

France also had technical motivations for its nuclear program. As noted by our American expert, France had a very respectable nuclear physics program in place before the Second World War and understood the science behind the Manhattan Project. In addition to Bertrand Goldschmidt, two other French scientists became affiliated with American nuclear fission research during the course of the war: Frédéric Joliot's colleagues Hans von Halban and Lew Kowarski. These scientists were all critical contributors in the early years of the CEA.

Regarding the conceptualization of French nuclear doctrine, Général de Gaulle and Général Gallois were by far the two most influential figures. Other generals, such as Beaufre, Ailleret, and Poirier, were important but less significant. Gallois was the one who stipulated that "la dissuasion du faible au fort" was both possible and credible. Again, here, the English-language translation of this concept as "proportional" deterrence is a bit of a misnomer. Proportionality is only *implied*. The notion was that the French arsenal needed to be capable of striking targets and inflicting a level of damage that represented at least the equivalent of France's own economic and strategic value. Gallois' concept was one of the most resilient in French nuclear doctrine, and was last discussed by President François Mitterrand in 1988.

Général Gallois also was of the opinion that deterrence was not compatible with alliances. De Gaulle was willing to coordinate with allies, but not to sacrifice the independence of French decisionmaking. For de Gaulle, the defense of "France" extended far beyond the actual French territory. Any notion that de Gaulle's "national sanctuary" was limited by borders is a revisionist myth.

Regarding doctrinal implementation, as French expert Maurice Vaisse has said, "French nuclear doctrine could only be built from the means that existed." Thus, the French nuclear strategy that flowed from this doctrine was a *strategy of means*. France could not afford to be a conventional superpower, so it adopted the nuclear option as the ultimate safeguard. The price of this independence, however, meant that funds were taken from conventional forces and invested in nuclear research – a decision that was not supported by the military or by public opinion. Although there is no formal estimate of the overall cost of France's early nuclear program, there were clear consequences both for conventional forces and for French commercial progress, e.g. the delayed establishment of a modern telephone network. Means also drove targeting; it was impractical, economically, for France to even consider a doctrine other than anti-city targeting.

In the post-Cold War period, the concept of deterrence of the strong by the weak has not been used in public discourse. It has not disappeared, but it was not referred to in the 1994 Defense White Paper, and it has morphed into a doctrine that is somewhat more multifaceted.

Deterrence, for example, is now perceived to be required against proliferants, i.e., countries in the process of acquiring weapons of mass destruction (WMD), if these countries pose a threat to French survival. This argument was made in the 1994 Paper and reiterated by President Jacques Chirac in August, 1995, when he stated that "only deterrence protects us against proliferation." Similarly, the term "prestrategic" is no longer used because in the new environment, all weapons are considered strategic. There are three main rationales for French deterrence today:

- To deter major powers and proliferating powers from threatening French survival;
- To provide France with a continued independent capability and freedom of action; and
- To contribute to European security overall.

In terms of French targeting doctrine, France does not apologize for targeting civilians, because it is a necessary component of credible deterrence. The mere policy of targeting is not in itself a crime. Article 51 in the 1990s legitimized deterrence and self-defense. For France, the important focus is not *what* you target, but how you justify that targeting. In this regard, French targeting doctrine has always been both consistent and clear. "Anti-city" was deliberately omitted from the 1994 French Defense White Paper because of the new emphasis on greater selectivity and discrimination in targeting. In 2001, Chirac was more explicit about targeting because it was important to him to clarify the meaning of deterrence. During the French "NPR", the focus was on "centres de pouvoir" (centers of power), be they political, military, or economic. France believes that the "Anglo-Saxons" are somewhat hypocritical when it comes to anti-population targeting. The official U.S. policy since 1973 has been not to target populations, but the U.K. has no parallel legal restrictions. The U.K. has thought much more about Article 51 in the nuclear domain in legal terms than France has. It should be noted that even historically, a French "prestrategic" use of nuclear weapons was not inherently counterforce.

Discussion

The following is a Thematic Summary of the main points of the Group Discussion.

- The U.K. did not make a conscious decision to become a nuclear weapon state as France did; the British simply assumed that this was the obvious way for a great power to grow its military capability. The U.K.'s nuclear program also was very different pre-1958 than it was post-1958, not just in terms of delivery systems and materials, but also in terms of its position with respect to NATO. After 1958, the U.K. decided that it would utilize American nuclear weapons under NATO for warfighting purposes. The U.K. nuclear strategy in a European context became the NATO nuclear strategy, and this has endured.
- The notion of "flexible response" can be traced back to pre-1958 Great Britain, and not to the U.S. as is customary. The modernization of the U.K. force can be tied to developments around Moscow and the development of the Soviet ABM system; the U.K. retained the capability for an independent strike on the Soviet Union, but also had to work out plans in Singapore and Malaysia (the "East of Suez" context) to maintain its dialogue with the United States. Many projects for tactical nuclear weapons were conceived of in that era.
- With respect to the U.K.'s policy of entanglement, the concern in the early years actually was that the U.K. *would not* be able to "entangle" the U.S. in defense of Europe against the

USSR. The "second center of decisionmaking" was a diplomatically convenient policy for the U.K., as it allowed them to justify their own deterrent without claiming that the U.S. deterrent was not reliable/credible. Entanglement was dictated largely by technical pragmatism (e.g. assistance with arming, fusing, and missiles), but it never moved inside the physics package – independent codes were always maintained, and Polaris, for example, provided the U.K. with an independent ballistic reentry system. Nonetheless, entanglement required compromise, as was the case with the U.S. submarine bases that were established in Scotland. The U.K. had initially demanded that such bases be established far from populations centers, but the Americans were able to use their leverage to overcome British arguments.

- The U.K. and France differed in their perspective on what constituted a technically credible nuclear force, i.e. a reliable nuclear force. The U.K.'s wartime experiences caused them to focus on the impact of *defenses*. They were concerned that a small force would make them more vulnerable, as well as limit their target set. Thus they felt that a credible force was easier to guarantee with a *large* production run, which brought them closer to the U.S. position – in contrast to France's very gradual submarine program, for example. The U.S. and Russia clearly felt that smaller numbers were insufficient, as both of their doctrines were anchored to a triad with global reach.
- Targeting doctrine in France in the 1960s was centered around the notion that the Soviet Union would neither invade nor strike France if France could demonstrate to Moscow that it could inflict at least as much damage on the USSR as France was worth to Moscow as a "prize". The French population numbered 45 million in the 1960s; the ability to kill 45 million Soviets therefore might be considered a benchmark for targeting. Alternatively, a city could be targeted because it was the repository of equivalent political or economic power. The French adopted a countervalue (anti-city) posture because it was cost-efficient (and therefore compatible with their "strategy of means"); because it supported their deterrent doctrine; and because it addressed the perceived threat from the Soviet Union. The bottom line at low levels of nuclear weapons was: "if not cities, then what?" The French also perceived "deterrence" to inherently imply low levels of nuclear weapons. A counterforce doctrine and a strategy of preemption both were believed to be significant drivers of arms races, and therefore were incompatible with a purely defensive, deterrent doctrine. Even the French "ultimate warning" clause did not include classic counterforce targeting.
- Targeting doctrine in the U.K. also focused on "city-busting" as the approach most compatible with deterrence. As the Soviet Union was a centralized state, Moscow also offered an obvious "decapitation" opportunity. There was quite a bit of debate among the scientists and engineers in the Atomic Weapons Establishment (AWE) concerning ethics. Fundamentally, however, they were comfortable with the notion of countervalue targeting. Trident missiles presented ethical quandaries for scientists because they did provide a preemptive capability, but privately, the U.K. was comfortable with a counterforce component. Discussions even in the early-1950s included potential counterforce attacks on Russian air and submarine bases. Counterforce elements in the U.K. targeting doctrine are also linked to the overall NATO strategy.

- The asymmetry between France and the U.K. with respect to targeting is linked to geographic assumptions that can be traced back to the legacy of World War II, where France was *invaded* while the U.K. was *heavily bombed*. Thus, France was focused primarily on deterring another invasion, while the U.K. aimed to deter a counter-city strike from the perceived enemy. The British also were concerned about protecting channel ports – so invasion scenarios were included in their thinking. The 1955 Strath Report (then top secret, made public in 2002) discusses the impact a nuclear strike would have on the U.K. – this document became the basis for most U.K. targeting decisions.
- In the U.K., in the early-1950s, there were considerable inter-service rivalries concerning nuclear roles and missions. A similar debate existed in France. Today, in France, the thinking on inter-service issues is only preliminary; the debate is not as extensive as it is in the United States. In the 1950s and 1970s, a nuclear capability was considered an asset to a service. Today, the service *without* nuclear weapons (namely the French Army) feels morally superior. The other services are perceived to be "stuck" in the nuclear business. At the same time, land forces must live and fight under the nuclear shadow. This debate does not exist in the U.K. today – the Royal Navy still has the high ground.

Facilitated Discussion: What is Required for Deterrence at Low Levels of Nuclear Weapons?

Key questions for this session were:

- *Do numbers matter?*
- *How can an adversary's threshold of "unacceptable damage" be determined with a high degree of confidence?*
- *How is deterrence communicated publicly and privately?*
- *What can undermine stability at low levels of nuclear weapons?*

The following is a Thematic Summary of the main points of the Group Discussion, organized around the four questions above. The discussion was moderated by a United States Nuclear Expert.

Do numbers matter?

- Generally, numbers of nuclear weapons matter as long as you know how to interpret them. What is required is the self-confidence that your deterrent capability is sufficient. One of the key questions is who is deterring who? North Korea arguably needs very few nuclear weapons to have an effective deterrent. Would India be deterred by two Pakistani weapons? Another factor is what can actually be hit with a given number of weapons; the identity and size of adversaries and their geographic position with respect to a nuclear-weapon state (NWS) will have an impact on the degree to which numbers matter. It is also important to ask, "numbers of what?" Numbers of weapons delivered on target are more significant than numbers in arsenals, because it is successful delivery that ties into credibility and survivability issues.

- For France, numbers don't matter in the sense that France is the fourth-ranked nuclear power, and this "ranking" is of no import. France has undergone a transition in its thinking on numbers. Numbers mattered when a major power was perceived to be the adversary. The number of weapons was based on an evaluation of what France represented to the enemy and of the threat France was trying to eliminate. The key question was, "is survival at stake?" Général Gallois' 1960s writings on the logic of proliferation suggested that once a country had used its nuclear weapons once, it was "naked" in the face of a second strike or relative to other nuclear powers. The "Day After" scenario during the Cold War was "the End of the World". Today, we no longer believe that the world will end with a nuclear attack. A country can use its nuclear weapons and still find itself in a deterrent situation; it can still deter a regional power while in conflict with a major power. Numbers matter less in the post-Cold War environment when most adversaries are likely to be regional (i.e. small) countries. In a WMD context, France has a sufficient number of weapons to be able to dissuade.
- In the U.K., numbers did matter and were originally driven by the Moscow criteria and, specifically, the ABM system in place around Moscow. With the Chevaline program, the numbers went down, but the goal remained breakdown-level damage of Moscow. There has been a debate on the number of delivery systems that the U.K. should have – it currently has only one, while France maintains two. For the U.K., reload capability is the key. Today, the rather arbitrary figure of 200 weapons is deemed sufficient to lend credibility to the British deterrent. Regarding the "day after" scenario, there is a notion in the U.K. that deterrence might fail and need to be reestablished – but that it can indeed be reestablished, and that the means of deterrence are not purely nuclear.

How can an adversary's threshold of "unacceptable damage" be determined with a high degree of confidence?

- The notion of damage is evaluative and thus more straightforward when applied to a single "great power" adversary. In the face of multiple adversaries – or with sequential crises or adversaries who are small regional powers – the overall evaluation is much more challenging. Today, therefore, the threat is very hard to measure because the primary metrics are intentions, capabilities, and often intangible regional stability factors. In a sense, "what will deter the enemy" is *inherently unknowable*, because it will depend on a range of psychological factors and sometimes irrational personalities, whose actions under pressure are difficult or impossible to predict.
- For a country like France, the "unacceptable damage" rationale is no longer compatible with a strategy of means – financial resources are not sufficient to sustain this approach towards multiple adversaries. In general, the French definition of unacceptable damage is focused on political, economic, and military "centers of power". It is measured in large volumes of casualties, not isolated elements of destruction. Damage is unacceptable when it puts survival at risk.

- The U.K. has a very small target set. Ten 1-MT weapons would be sufficient to "kill off" the United Kingdom. Thus, that small number is sufficient to inflict "unacceptable damage". The target set in the USSR was much larger.
- Two interesting side notes: (1) *Collateral* damage (for example, elimination of oil reserves, which threatens *long-term* survival) is almost never included in the calculation of "unacceptable" damage. With regional powers now coming into play, that calculus needs to change; collateral damage, usually inflicted through targets that lie outside of cities, should factor into assessments of unacceptable damage. (2) It is important to remember that sometimes even *conventional* war damage, such as that inflicted in World Wars I and II, is unacceptable.

How is deterrence communicated publicly and privately?

- A deterrent is useless if it is not communicated. Two important facets of communication are credibility and leadership. The Israeli deterrent is credible because Israel has a long track record of responding robustly to attack. As discussed previously, Charles de Gaulle lent tremendous credibility to the French deterrent through his sheer presence at its helm. When French leadership has been perceived to be weak, as was the case for a period under President Valéry Giscard d'Estaing, political rivals have suggested that the viability of nuclear deterrence might be at stake. Jacques Chirac has played this "character card" and has made a point of stressing his resolve to use nuclear weapons if necessary. These public communications are an important component of a deterrent strategy.
- Another important facet of public communications is capabilities – actions and arsenals speak louder than words. In the past, both British and French capabilities often were demonstrated through testing, which was an important component of signaling for both countries. For example, the test firings of the Chevaline in the U.K. were clearly witnessed by Russian intelligence. Capabilities for both the U.K. and France are not centered around sheer numbers – which are low – but around plans. In terms of sheer numbers, France's submarine component is not credible, for example. It becomes credible in the broader context of French capabilities.
- The public expression of deterrence in the U.K. in the early years was worded very cautiously: ministers did not explicitly state that the U.K. would use nuclear weapons if provoked, but rather suggested that an adversary should not assume that they would *not*. The debate over counter-city targeting and the moral dilemmas that come with a deterrent posture are still at the heart of U.K. policy articulation. The French were deliberately ambiguous throughout the 1960s and 1970s in their public discourse about the targeting of populations and cities. More recently, in a speech in 2001, Jacques Chirac stated that, due to current sensitivities, it was no longer possible to think about anti-city targeting in the same manner. He noted that the French deterrent doctrine remained strictly defensive, and that targeting decisions therefore continued to be centered around the French ability to *retaliate*. The French Prime Minister stated in 1999 that "even distant" threats could be countered; the implication was Asia, although this nuance was not articulated explicitly.

- Private communication of a deterrent is a sensitive topic. There is no question that it is critical, and also that a very precise vocabulary must be used when communicating privately so that there is no ambiguity (in contrast to public discourse which is often deliberately hazy). For example, in public discourse, the American NPR refers to "reductions"; privately, it is clear that these are more of an adaptation to targeting requirements than real reductions. Private communications generally take place at fairly senior levels. During the Berlin crisis, Charles de Gaulle is reported to have said to the Russian Ambassador, "we will die together."
- There are many contradictions to work through when evaluating the communication of deterrence. A delicate balance must be struck between opacity and transparency. Too much ambiguity can be dangerous even in public discourse. It is important to be clear that a response (i.e. punishment) *will* take place, even if the *means* by which that response will be implemented are left ambiguous. A country's statements about its readiness to respond must be supplemented by the visibility of a *wide range* of possible responses. At the same time, too much transparency can lead to increased vulnerability. Today, for example, increased transparency on arms control with China, which is desirable, could also reveal our assets to terrorist groups and make us more susceptible to being attacked. France, Great Britain, and the United States all strike a different balance in communicating actions and means. France threatens a nuclear response (for example in the case of a chemical or biological attack), but the threshold for that response is ambiguous; the U.K. has a clearer threshold, but the nature of the "proportional response" is uncertain; and the U.S. guarantees an overwhelming and devastating response, but the instruments of that response are vague.
- Today, deterrence is not necessarily focused around nuclear assets, particularly when it comes to "rogue" states or terrorist groups. Special Forces, for example, are much more effective against small, networked adversaries than large conventional or nuclear weapon systems.

What can undermine stability at low levels of nuclear weapons?

- Several factors can undermine stability: too great an expenditure of funds; too much ambiguity about intentions; too much technology; and too much independence. Pakistan might be a good case study for the independence question. For example, how confident are the Pakistanis that deterrence would work for them if China were not in the picture?
- Stability can be undermined if numbers are small and those small arsenals are vulnerable. *Defenses* are therefore key to maintaining stability at low levels of nuclear weapons.
- ABM systems by definition undermine stability – the offense will always win.
- Fanaticism and fundamentalism undermine stability.

Implications for Other Nuclear Powers: Emulation? Innovation? Indifference?

The goals of this session were (1) to consider the applicability of deterrence at low levels of nuclear weapons to the United States and Russia; and (2) to speculate on potential approaches that proliferants with a small number of nuclear devices might develop to deter or coerce large nuclear powers.

Presentation – Implications for Other Nuclear Powers

Presented by a British Nuclear Expert

The lessons of the British and French experiences are largely irrelevant to countries like the United States and Russia, and have little to teach proliferants – with a few exceptions. One must be very cautious in extrapolating from the development of the British and French programs and applying their thought processes to other regions, partly because the mentalities and *cultures* that molded the programs in France and the U.K. were critical and are not mirrored in other parts of the world. A régime such as Iraq's has a very different attitude towards life, for example – this is a government that has a lack of respect for civilian casualties, has gassed its own people, and has sacrificed a large number of its children (mostly young boys) in its war against Iran; you can't apply a French or British rationale in such a country.

Attitudes towards defense are not necessarily logical, either in countries like the United Kingdom, where we have a warped idea of our own vulnerability (the British literature of the 1950s suggested a much greater degree of relative bombing during World War II than was statistically the case), or in aspiring proliferant countries where leaders frequently are irrational decisionmakers. It takes time for a country to think through what nuclear deterrence and the use of nuclear weapons really mean, and for that country's government to recoil. Minimum deterrence suggests backing away from the battlefield use of nuclear weapons; the French public discourse on nuclear weapons, for example, referred to them as "armement de nonemploi" (weaponry that would never be used). In many cases, however, such a rationale does not factor into the thought process of a proliferating nation; its leadership will *not* conclude that a nuclear weapon system is at odds with that country's own moral belief system.

Perspectives on nuclear weapons can change over time in both established NWS and in proliferating countries. For example, immediately after atomic weapons were dropped on Hiroshima and Nagasaki, support for their use in the United States was much greater than it was 10, 20, 30, or 40 years later. In France, nuclear deterrence was considered a strategy that could not fail, and there was little public debate about the use of nuclear weapons. In the U.K., by contrast, there was much greater domestic opposition to a nuclear program, particularly when the country was faced with the danger of nuclear retaliation or preemptive strikes. More generally, in the United States, there has been a growing sensitivity to casualties. The country was publicly shaken by the events of September 11th, 2001; the United Kingdom is more stoic in the face of terrorism. Tony Blair recently commented on potential chemical or biological attacks in Tube stations, noting that "if we allow potential attacks to deter us, we are letting the terrorists win." India and Pakistan have shown a relative insouciance towards potential civilian casualties, as evidenced by their public discourse in 1998.

While the overall French and British approaches cannot be extrapolated to proliferants, some elements of their nuclear deterrence doctrines are relevant. As was mentioned before, the writings of Général Gallois have been widely circulated in Iraq. Iraqis take a leaf out of French deterrence doctrine in their view that nuclear weapons provide a "sanctuary" and also some room for political maneuvering. India has emphasized sovereignty as a rationale behind their nuclear proliferation. So some areas are worth exploring.

Discussion

The following is a Thematic Summary of the main points of the Group Discussion.

- The legacy of de Gaulle is one of the reasons that there has been such a low level of anti-nuclear sentiment in France. Charles de Gaulle did stress the horrific consequences of a nuclear exchange, but was privately and publicly comfortable with the use of atomic weapons. De Gaulle, French independence, and nuclear weapons all became strongly linked in the popular psyche, and the lack of a pacifist movement in France is a direct result of these original national linkages.
- It is clear that both India and Iraq are learning from the French experience. Iraq has already been discussed. Indian nuclear doctrine has echoes of French texts. In particular, Indian doctrine harkens to Article 51 of the United Nations Charter; discusses "strategic autonomy"; and refers to the concept of "unacceptable damage". Also, elements of the French and British experience that are not relevant to emergent proliferants today may become relevant 20-30 years down the road. The cultural differences may not persist over time. European sensitivity to casualties and perception of the value of life has evolved and is different than it was in the immediate aftermath of, for example, Verdun or Dresden.
- The targeting debate is also different for proliferants. The situation in Asia is much more complex now than it was during the Cold War. Asian nations, in formulating their nuclear strategies and targeting guidelines, have access to technologies that France and the U.K. lacked in the early years of their programs, such as imaging, precision guidance systems, etc. This changes the nature of the discussion concerning anti-city targeting, for example. In the post-Cold War period, it is interesting to speculate about adversaries as a basis for nuclear proliferation. For China, the baseline adversary is the United States; for India, the baseline adversary is China; and for Pakistan, the baseline adversary is India. Who is the baseline adversary for the U.S.? Arguably, it is still the greatest non-allied power, namely, Russia. Russia also remains a reference point for planning in the U.K. and France. At what point does a country conclude that its former adversary does not warrant planning against?
- If new nuclear nations choose to emulate France or the U.K., the debate over numbers of weapons will be different, especially publicly. How can "deterrence" be discussed when a country is opaque about numbers? When one looks at South Asia, with India, Pakistan, Iran, and Iraq all abutting each other, do potential regional multipolar nuclear groups factor into a global discussion of numbers (and arms control)?
- Regarding numbers in the declared NWS, the psychology of prestige is more important in Russia and the United States than it is in France or the U.K. Does the symbolism of

maintaining parity still matter to the U.S. and Russia? When will the U.S. start feeling "lonely" as the only superpower and truly bring its number of nuclear weapons down? It has many conventional alternatives that the U.K., France, and Russia don't have, and it has both a nuclear military and a non-nuclear military. The U.S. is less concerned about being a nuclear superpower today, but that would change if it ever fell below parity with China or Russia. It will also be difficult for the United States to truly reduce its stockpiles until it scales its massive nuclear infrastructure down. Does the U.S. still need both a Livermore and a Los Alamos? The U.S. suffers from the legacy of its previous conception of "necessary damage", which to Robert McNamara was "75% of the Soviet population and 80% of their infrastructure". The U.K. has a better production capability than the U.S. (the U.S. cannot make pits) but keeps its numbers of weapons low. Perhaps the U.S. will learn about the strategy of means as it confronts related issues – for example, its hypothesis that only \$1 billion is required to vaccinate all Americans safely against all known pathogens.

- How could a proliferant régime use nuclear weapons to deter the U.S.? As noted by de Gaulle, weapons have political as well as strategic value; others could deter the U.S. based on political factors, especially if combined with the threat of use of other WMD such as biological weapons. At the same time, this rationale did not deter Sadat from attacking Israel in 1973. Proliferants will obviously weigh risks against benefits, but we do not have a clear understanding of their values or of the psychology behind their decisionmaking processes – so we will evaluate them largely on their technical actions.
- Lastly, different countries' legal structures have had some interesting impacts on and implications for their nuclear doctrines and strategies. France's deterrent doctrine was always more straightforward than the United States' because it did not have to confront the massive litigation issues that the U.S. did (e.g. with Native American tribes). The transparency in France's program comes largely from the civilian applications of nuclear technologies, e.g. energy. The U.K. has the most transparent program in the world because that program can be halted through litigation – the AWE can actually be sued.

DETERRENCE AT LOW LEVELS OF NUCLEAR WEAPONS: A REAPPRAISAL

CHINA EXPERTS' MEETING

*Science Applications International Corporation
McLean, Virginia Campus
March 4, 2003*

Workshop Summary

Christine Cleary, Rapporteur

This summary is non-attributive. For clarification purposes, the nationality of expert participants is indicated where relevant.

Introduction

At the request of the Advanced Systems and Concepts Office of the Defense Threat Reduction Agency (DTRA), Science Applications International Corporation (SAIC) undertook a research project “Deterrence at Low Levels of Nuclear Weapons: A Reappraisal”, a project aimed at examining the concepts of deterrence held by nations that only have a limited number of nuclear weapons. Over the course of the project, the nuclear doctrines, strategies, and force postures of the United Kingdom, France, and China were evaluated in turn. As part of the China portion of project, SAIC organized a China Experts workshop on March 4, 2003 in McLean, Virginia. This workshop was comprised of China nuclear experts, including a prominent Chinese academic from Fudan University in Shanghai. The workshop had three main objectives:

- To examine the implications of deterrence at low levels of nuclear weapons for the evolution of the Chinese nuclear program.
- To examine the concepts and requirements of deterrence as held by China.
- To evaluate the implications of low-level deterrent strategies for rogue states and also potentially for the United States and Russia as they draw down their number of nuclear weapons.

The Origins and Evolution of China's Nuclear Strategy

The objective of the first panel was to evaluate the assumptions, threat perceptions, and political and technical considerations that have shaped Chinese nuclear strategy, doctrine, and force posture. An American analyst opened the session by presenting some of the themes found in a survey of open-source Western and Chinese literature on Chinese nuclear doctrine and strategy.

There is a relative dearth of limited open-source data relating to Chinese nuclear strategy, particularly with respect to such areas as operational doctrine, targeting, and command and control. Within these constraints however, a few patterns and themes emerged. China's nuclear strategy has been shaped by a convergence of factors including the Chinese assessment of the

international security environment, in addition to a mix of political, ideological, technical, and economic factors. Of these factors, the technical considerations appear most often to be the primary driver behind the establishment and evolution of China's nuclear strategy. Participants were encouraged to consider two questions throughout the panel's proceedings:

- If the factors presented were still the most significant drivers today in the debate over the current status and direction of China's nuclear strategy; and
- Whether "Nuclear Minimalism" is China's strategic future.

Political factors

Several political considerations prompted early Chinese consideration about acquiring a nuclear weapon. To begin, Beijing recognized early that an independent nuclear arsenal would further China's policies and enhance its international standing. The Chinese Communist Party's (CCP) is said to have been pondering a nuclear weapons capability as early as 1946 when Kang Sheng, head of Communist China's secret service, began systematic recruitment of overseas Chinese nuclear and rocket scientists.

China claims that its acquisition of nuclear weapons was in response to its perceived threat environment; including the threat from U.S. nuclear blackmail, the threat of U.S. encirclement, and by the early 1970's, the threat of invasion by the Soviet Union. This perceived threat environment led China to declare that it had acquired nuclear weapons as a "regrettable necessity." Immediately after its first nuclear detonation in 1964, China put forth the doctrines of No First Use (NFU) of nuclear weapons, no threatened use of nuclear weapons against non-nuclear weapons states, and the pledge that ultimately, China favored the complete and total abolition of nuclear weapons. These claims have remained a central part of Chinese declaratory doctrine to this day.

Political ideology was another important political driver, which shaped Chinese nuclear doctrine. China's declaratory nuclear doctrine appears closely linked to Chinese political ideology and its overall military doctrine. For example, Mao Zedong originally formulated China's revolutionary struggle in terms of "Peoples War." He stressed the importance of "man over machine." In 1946 Mao derided the atom bomb as a "paper tiger." Mao's proclivity to conform nuclear thinking to his revolutionary ideals delayed any serious strategic thinking about operational and use issues with respect to nuclear bombs. However, it seems as though the technological achievement of Chinese nuclear bombs and missiles was an impetus for Mao to recast the revolutionary struggle into one with a military-technical emphasis that relied on assured nuclear retaliation to ensure deterrence.

During the Deng Xiaoping Era, some modifications of PLA doctrine, strategy, and tactics began to occur. In the early-1980s, Su Yu coined phrase of "Peoples War Under Modern Conditions." This doctrine placed emphasis on concepts of active defense, flexibility, and mobile warfare. The early articulations of this doctrine seem to have coincided with the Chinese development of a Chinese second-strike capability in the 1980's, when China first tested an intercontinental ballistic missile (ICBM).

The strategy of Active Defense relates to China's nuclear forces in that it seeks a posture that ensures strategic defense with operational and tactical offensive operations during time of war. China maintains that the scale, composition, and development of its nuclear weapons is in line with this strategy and this has been articulated in the recently released White paper, "China's National Defense in 2002."¹ However, given that uncertainty exists as to the true extent of the scale, composition, and development of China's nuclear forces, how the active defense strategy translates into long-term force posture objectives remains to be seen. The military strategic guideline of Active Defense is also relevant to Chinese nuclear strategy in that it stresses deterrence of nuclear war based on winning local wars under modern, especially high-tech conditions. In that respect, Active Defense complements the most recent articulation of military strategy put forth by China, that of Limited War under High Tech Conditions. While there are varying interpretations of this strategy as well, some literature has suggested that this doctrine features the ability to wage a limited war with a willingness to escalate to strategic nuclear use if necessary.

There are two other important political drivers with respect to the origins and evolution of Chinese nuclear strategy: Sino-Soviet Relations and U.S.-China relations. To begin, the Sino-Soviet nuclear relationship evolved through three periods: dependency (1955-58), interdependence (1959-60), and ultimately, self-reliance (1960). This relationship provided China with technical shortcuts for its nuclear program. However, particularly during the period of interdependence, Chinese reliance on Soviet nuclear doctrine appears to have hindered Chinese independent strategic thinking about nuclear weapons. By 1969, the threat of Soviet attack seemed very real in the minds of Chinese leaders. The combination of Chinese conventional weakness and the possibility of Soviet limited territorial gains forced the Chinese to begin strategic thinking about the dilemma between the ideologies of "peoples war" and "limited war" and also about the strategy of active defense.

The China-U.S. relationship also was a key driver in shaping China's nuclear strategy. As noted, U.S. nuclear threats were an initial driver of the program, however, it appears that Chinese concern shifted to Soviet strategic intentions and regional threats throughout 1970s and 1980s. Since then, China has refocused on U.S. strategic intentions globally and also within the Asian-Pacific region. For example, Chinese strategic thinking about a potential conflict over Taiwan will likely impact the direction in which China's nuclear strategy evolves. Chinese build-up of short-range missiles opposite Taiwan has created uncertainty in the United States regarding Chinese thinking about the coercive and warfighting utility of these missiles, specifically and China's nuclear forces, more generally. For China, U.S. ambitions of "Absolute Security" have heightened concerns. The prospect of U.S. missile defense has introduced the concept of "deterrence by denial" as opposed to traditional "deterrence by retaliation." Furthermore, these concerns are exacerbated by the prospect of U.S./Russia cooperation, particularly on the issue of missile defense. To Chinese thinking, such cooperation could potentially render the Chinese deterrent impotent.

¹ "China's National Defense in 2002," published by the Information Office of the State Council, China; 9 December 2002. <<http://english.peopledaily.com.cn/features/ndpaper2002/nd.html>>

Technical and Economic Factors

Technical and economic factors were both inextricably linked and fundamental to the development of Chinese nuclear strategy. This is due to the fact that whereas technological abilities and milestones appear to be the primary driver behind China's nuclear strategy, these technological factors were most often dictated or constrained by economics. To put this position in a larger context, the country's National Development Strategy determines the defense policy and overall military strategy. The National Development Strategy features a long-term commitment to national modernization with an insistence that strategic capability be subordinated to long-term economic growth.

It seems however, that the Chinese nuclear weapons and missile programs were afforded a certain "insulation" from the economic trade-offs dictated by the National Development Strategy and also from cultural pressures. This protection likely stemmed from the Chinese perception that China's nuclear weapons would contribute to Chinese development of a modern scientific and industrial base and ranking in these areas.

Within this relatively insulated construct, Marshal Nie's weapons strategy, which was developed circa 1956, was identified as an influential directive in China's nuclear weapons progression. His directives gave priority to technical research for qualitative improvements over weapons production for quantitative augmentation. This technical decision appears to have embedded itself deeply in the Chinese nuclear weapons program, as it still seems that as China modernizes its nuclear weapons, it seeks to make qualitative enhancements (i.e., enhanced survivability) as opposed to increasing the numbers of its missile force.

The combination of Nie's directives with both the insulation from economic and cultural pressures and Soviet assistance facilitated a rapid progression of the Chinese nuclear program. China was able to move immediately to a U-235 implosion device; and this technical achievement was followed by quick jump to multi-stage hydrogen bomb. In terms of the relationship between these technical accomplishments and Chinese nuclear strategy, the drive to achieve success with respect to these technological directives – uranium implosion and a hydrogen bomb - took the place of an articulated nuclear doctrine early on.

Another important economic and technical factor was that China avoided the costly route of accurate weapons, focusing instead on high-yield nuclear weapons. This technical decision constrained China to a counter-value targeting posture. The strategic rationale that followed from this economic and technical constraint was that the ability to hold cities at risk was enough to ensure "mutual vulnerability" between nuclear powers. The development of this rationale also coincided with recognition on the Chinese part that numerical parity was not necessary to achieve credible deterrence.

The slow reaction time of China's missiles, however, necessitated development of highly dispersed, concealed, and mobile forces. Uncertainty and calculated ambiguity became organizing principles for Chinese strategy, as a result. In short, current Chinese strategy rests on the possibility that a few undetected Chinese ICBMs, launched in retaliation, is enough to deter the United States from attempting a preemptive nuclear strike against China. It is the uncertainty

of U.S. estimates, rather than the total number of Chinese ICBMs, that is directly relevant to the credibility of the Chinese deterrent in its current form. This strategy formulation allowed China to achieve a “stable yet unbalanced” relationship with the other nuclear powers.

The Gulf War and U.S. actions in Yugoslavia demonstrated U.S. improvements in advanced conventional strike and underscored China’s need for military modernization. The modernization directives were for enhanced survivability, striking ability, and improved penetration technology for China’s strategic nuclear weapons. Over the last decade, China’s efforts to modernize its forces have fueled the debate over whether China remains comfortable with its minimum nuclear deterrent or if it seeks a “limited” nuclear deterrent strategy.

A caveat with respect to the debate over minimum versus limited deterrence is in order. Currently, a “debate over the debate” exists in the West. It is possible that the debate over minimum versus limited deterrence has already taken place in China and the results are not yet evident. The other possibility is that a major shift in China’s nuclear deterrence strategy could be contingent upon decisions that the U.S. will make in the near future.

Various options for the Chinese nuclear strategy in its current form were sketched out. The frameworks included minimum deterrence, limited deterrence, or a tiered or variegated approach to deterrence. The latter of the three appears to be the option that most accurately reflects China’s nuclear strategy in its current form. This framework, which has been delineated by Drs. Mulvenon and Gill, takes into context that Chinese strategic planning considers more than just the United States, in that it seeks a credible deterrent at the strategic level, a limited, nuclear-capable counterforce at theater level, and an offensive, conventional theater warfighting posture.

A Chinese Perspective

Open sources on these issues are limited, due mainly to the central role of opacity in Chinese nuclear strategy. Given this lack of information, it is possible to interpret the drivers of strategy from different angles. In the Chinese participant’s opinion, the evolution of Chinese nuclear strategy was indeed a result of the convergence of numerous political, economic, and technical drivers. However, whereas Americans tend to emphasize more the technical drivers of strategy formulation, the Chinese tend to focus more on the overall grand strategy as opposed to its disaggregating its driving forces.

Within the overall Chinese grand strategy the major driver for China’s strategic force development was, and is currently, political considerations. Were it not for U.S. pressures, including rhetoric in the 1950s from the U.S. military, China would not have undertaken to develop nuclear weapons, particularly given the economic constraints facing China after the Korean War. In order to counter U.S. “bullying,” Mao and his associates decided on January 15, 1955 in a CMC planning meeting to acquire nuclear weapons. Other political considerations, including any enhancement in international standing, were viewed as a major by-product of acquiring the weapons.

Technical and economic factors were not necessarily drivers of the Chinese nuclear weapons strategy but rather were implementers. The loss of Soviet aid to the nuclear program and China's economic weakness were two major constraints on the program's growth. Furthermore, these limits prevented China from developing a counterforce targeting posture. However, despite these constraints, China could have developed a larger force. The force size was determined by political factors in that the Chinese leadership considered the ability to hold U.S. Asian bases hostage "good enough" and therefore, further numerical augmentation beyond what China had already developed was deemed unnecessary.

In sum, the political factors were the primary force behind the Chinese decision to acquire nuclear weapons. Over time, the economic and technical factors served as constraining forces on the program. Currently, however, the lessening of these economic and technical constraints has presented numerical increases as an option for the Chinese program. The situation is flipped, in that in contrast to history, the political factors are now constraining nuclear growth. Specifically, China can today afford to build more than 24 ICBMs, however, Jiang Zemin is still committed to tempering any unnecessary U.S. apprehension, despite U.S. introduction of missile defense.

There is a majority within the Chinese analytic community that believes that China has a need to restructure its nuclear forces. All drivers will be important in formulating the future of the Chinese nuclear strategy. However, the size of the future Chinese force will likely be contingent upon the scale of U.S. missile defense in combination with the China's perceived threat environment. The size of the forces, in turn, will impact concepts of minimum deterrence. Missile defense will factor into the Chinese calculus of deterrence in that China will seek an "effective minimum deterrence" in order to counter U.S. missile defenses.

Will China "do more" regardless if it makes sense strategically? There is no debate in China on this question, however, in private, there are discussions about the need to use resources in order to expand China's nuclear program in terms of missile quantity. China is modernizing its nuclear forces but that process is constrained by concern that an "excessive" build up would bring instability with it. China may choose to "offset" U.S. missile defense but any such decision will be undertaken at a sizeable scope, so as not to undermine deterrence. But "offsetting" U.S. defenses has quite a broad range of possibilities associated with it: this could include build-up anywhere from 24 to 500 missiles. Ultimately, this decision will rest upon the Chinese definition of "effective minimum deterrence" commensurate with the size of U.S. missile defense. The quality of Chinese nuclear forces would improve with or without missile defenses.

Mao's doctrine was initially based on the perception that nuclear weapons were viewed as negative by the rest of the world. Therefore, the justification for acquiring these weapons had to be that China's nuclear weapons were in response to U.S. pressure, while simultaneously, China had to pursue nuclear weapons in a way that gave the least invitation to preemption. However, these principles are not necessarily the best model for U.S.-China deterrent relations. China could go beyond Mao's views today, particularly in that China needs more flexibility. China seeks to attain a grand strategy of overall development while simultaneously maintaining that nuclear weapons are unusable at the strategic level.

The two sets of comments regarding the origins and evolution of Chinese nuclear strategy stimulated a general discussion, which addressed many of the conceptual aspects of nuclear deterrence, considered thematically below.

Multi-polarity and Regional Considerations

Participants considered the current trend towards multi-polarity and wondered as to the extent to which current open source literature has addressed the multi-polar dimension of Chinese strategic planning. The participants concurred that there is not extensive coverage of this aspect of Chinese nuclear planning, however some valuable thinking on the concept tiered deterrence has been developed. This option was identified as a valuable lens, through which Chinese thinking on both U.S. and theater contingencies, in addition to the implications of multi-polarity and Chinese regional challenges could be evaluated.

In addition to numerous regional considerations for China, the importance of Russia and India in Chinese defense planning was explicitly mentioned. In the past, some have discounted the role of these two countries in Chinese planning, however, there are some cases where actions by these countries could influence nuclear doctrine. One such example could be Indian deployment of rail-mobile nuclear-tipped Agni missiles in the Himalayan Mountains. This development could prompt a potential push for a modern nuclear counterforce in Chinese doctrine, particularly from the within the Second Artillery Corps.

India

Participants differed on their interpretations of how important India truly was to Chinese strategic defense planning. Planning against India is a fundamentally different situation for China, in that China is operating from a position of superiority. Chinese military planners tend to think that India has nuclear weapons for status, and in order to hedge against the threat from Pakistan. In that case, India will avoid numerically “matching” China’s nuclear weapons. If India maintains its current level of weapons, the country would occupy a lesser role in Chinese nuclear planning.

Alternatively, India could pose a threat to China over the long term. Currently, however, the slow growth of India’s missile program indicated that the Sino-India relationship would remain non-adversarial. However, Chinese-Indian dialogue is necessary in order to ensure use of non-military means to settle disputes.

Soviet Strategic Thinking

History suggests that the early interdependence of the Chinese and Soviet nuclear programs allowed China to look to Soviet operational doctrine as opposed to formulating its own. For example, the name of China’s strategic force, the Second Artillery, is actually derived from Soviet terminology. China might have looked to the USSR regarding the debate about compensating for conventional weakness with tactical nuclear weapons. There is the potential that Soviet influence was factored into the question of how much escalation control is needed to

contemplate tactical nuclear use at the theater level. Finally, Soviet debates about the need for strategic cover and the number of weapons needed for a counter-escalation capability may also have been influential on Chinese strategy.

Participants also discussed the question of how China is currently looking at lessons from the Russian nuclear experience. They wondered as to the influence of Russian thinking about “mini nukes” on Chinese considerations about escalation capabilities and nuclear use for war termination. However, regardless of this influence, it was also noted that the Chinese are deeply imbued with the perception that the Cold War arms race was a major contributor to the downfall of the Soviet system, and therefore the Chinese model will not be one that is large, expensive, or prone to arms racing.

An intermingling of strategic nuclear ideas was and currently still is likely occurring. However, it is not limited to Russia-China exchanges. China is likely influenced by U.S. thinking as well, particularly on such issues as the Science Based Stockpile Stewardship Program. This give and take on internal and foreign views occurs on several levels; including within the Second Artillery, between academics involved in international exchanges, and finally, amongst policymakers.

Taiwan

One participant encouraged others to consider the regional element of China’s nuclear forces and stretch out the argument that the threat of strikes against the American mainland is what deters the United States. It was postulated that at the regional level, it is less clear that nuclear strikes are a deterrent. If China were to take military action against Taiwan, there is the potential that the American response could include conventional strikes against China. Therefore what does deterrence mean in the most likely scenarios, that is, the regional scenarios?

Deterrence in the Taiwan Straits today is different from the past, where the U.S. response to such a situation could potentially have included a nuclear attack on Mainland China. This comment introduced discussion of the concept of counter-deterrence and its meaning within the Taiwan context. Namely, if China initiates counter-offensive operations against Taiwan, the goal of counter-deterrence will be to dissuade America from interfering in China’s operations versus Taiwan. There are crisis stability issues inherent in these counter-deterrence options in that they point to nuclear use. Alternatively, another participant suggested that “counter-deterrence” was only a term that the Chinese use because of the imbedded terminological aversion to the word “deterrence.”

The debate over Taiwan and discussions regarding theater/regional considerations in Chinese strategic planning seek to draw out the issue of intra-war deterrence and escalation control. The issue of regional deterrence in Taiwan is in many ways an analogue to pre-strategic strike in Chinese. Within the theater, Chinese ballistic missiles are dual-capable, and this force posture signals, from the start, that there is potential for surprise and for nuclear use. Indeed, this overtly constructed force posture may be designed to sow uncertainty. Another dimension of the pre-strategic question is the current uncertainty regarding Chinese contemplation of potential

nuclear uses that could fall below the American retaliation threshold in the Taiwan Strait (e.g., EMP).

The Chinese participant offered that if the United States uses any means whatsoever to back *de jure* independence of Taiwan, it would be considered an offense to China's core interests. Given the high stakes over Taiwan, his view was that China believes that Washington will take a measured approach on the issue of Taiwan.

*Tiered Deterrence*²

Tiered deterrence takes a three-level approach to China's nuclear posture. It suggests first, that at the strategic level, China is moving towards a credible minimum deterrent. Secondly, China is beginning to think about an offensive, counterforce posture at the theater level. Finally, at the conventional-missile level, China may be considering the adoption of an offensive, war-fighting strategy.

An important point that resulted from this discussion was that perhaps in China's case, the traditional delineation of "strategic" as a function of distance might be incorrect. Rather, the purpose, interests, and objectives at each level may define whether the threat is considered "strategic."

Terminology & False Dichotomies

China is not simply limited to either a counter-value or a counterforce posture. For example, it is possible for China to have a counter-value targeting posture vis-à-vis the United States supplemented by the ability to target some soft military facilities in the region. This line of thought was furthered as participants discussed the 1999 Chinese defense white paper, which discussed strategic missiles and operational tactical operations during the time war.

Whereas U.S. scholars describe the Chinese nuclear posture as "minimal," this description may differ significantly from how China defines "minimal" or how China thinks about its nuclear weapons. An article from China's Academy of Military Science (AMS), for example included the terms "Minimal," "Maximum," "Parity," and "Limited". Another participant noted that a more recent AMS volume does not use the term "minimal deterrence." Rather, the new term resembles "medium strength nuclear deterrence."

Similarly, the Chinese participant identified the Chinese aversion to the term "deterrence" and its recent resolution in China. He claimed that currently, the Chinese define deterrence as the means to dissuade someone from doing something harmful by demonstrating credible retaliation. He noted however, that for a long time, deterrence was associated with capitalists, thereby placing China in a difficult position in trying to explain the utility of Chinese nuclear weapons. Finally, a few years back, this issue was addressed when China's Foreign Ministry posted the words "retaliatory deterrence" on its website.

² For a more thorough discussion of Tiered Deterrence, see Bates Gill and James Mulvenon, "The Chinese Strategic Rocket Forces: Transition To Credible Deterrence," unpublished study presented at *China and Weapons of Mass Destruction*, a seminar sponsored by the National Intelligence Council, November 1999.

Deterrence Requirements: NFU & Prestrategic Strike?

China's "retaliatory deterrence" doctrine features a commitment that China will not be the first to use nuclear weapons. This No First Use (NFU) pledge is somewhat ambiguous in its operational meaning and thus prompts many questions about the conditions and timings upon which China would launch a nuclear strike.

The Chinese participant offered his opinion that China should revisit the NFU pledge. A Chinese decision not to honor the pledge during a contingency could potentially make the Chinese deterrence more credible. He offered a "Conditional NFU" pledge could be disregarded on three conditions, if:

- 1) China's nuclear weapons were attacked with non-nuclear weapons;
- 2) China's nuclear weapons were attacked by other WMD; or
- 3) China's core interests (i.e., Taiwan) were at stake.

He furthered his argument by noting that in past dialogue with certain members of the Chinese military, many already have suggested that China might not necessarily adhere to NFU during a conflict.

Asked if China makes any provision for "pre-strategic" nuclear use as penultimate warning, the Chinese participant answered that China sees a nuclear weapon as a political weapon, a psychological weapon, and a weapon for deterrence. If there is ever a need to use nuclear weapons, he argued, it would be due to a failure of deterrence posturing. He added that the United States has vulnerabilities even as a superpower and that by introducing missile defense into the deterrence equation, Washington has indicated that *any* nuclear attack is unacceptable. *A priori*, China only needs to sustain a credible deterrent vis-à-vis the U.S. and only needs a limited capability to offset missile defense.

The Chinese participant then put forth the following criteria for the future Chinese nuclear force: larger, affordable, not destabilizing, and not hostile. In terms of numerical translation of these criteria, one option is ten times the size of the current force. He further argued that MIRVing has a psychological impact, and therefore, China will likely ready this capability but may not deploy it. The likely force structure will be affordable for China, a few times smaller than the U.S.'s arsenal to demonstrate that China has benign intentions, but will be larger than its current form in order to convince Washington that China's warning about Taiwan is serious. The rationale for this Chinese build-up is the U.S. pursuit of Missile Defense.

Missile Defense

The Chinese participant stressed that the Chinese government would likely strive for amicable political relations with the United States rather than a race on missile defense. He also noted that China has assumptions about the reliability of U.S. missile defense that will shape its force level calculus. China may also be considering other means of penetrating the defenses. If China did opt to build-up its forces in order to counter U.S. missile defense, and perhaps

deployed up to 200 ICBMs, U.S. missile defenses would then need to be even larger. The Chinese participant underscored that this vicious action-reaction cycle would be the worst case.

Modernization and Stability

A participant pointed out U.S. uncertainty and concern about Chinese MIRV plans, namely if China will place more than three warheads on its ICBMs. He suggested that if China places a high number of warheads on fewer number of missiles, instability would likely result.

In the view of the Chinese participant, there are different levels of meaning of stability. On one level there is the political stability of a relationship, for example between China and the United States, and this is the most commonly used form of the term “stability” in China. On another level exists strategic stability. This level of stability is more nuanced in that it entails a balance, which no one seeks to upset. On still another level there is balance of strategic offense and strategic defense. With respect to this level of stability, China favors the balance that was achieved by mutual assured destruction (MAD). He argued that recent technical advances might alter stability on many levels. For example, China’s technical community feels that MIRVing could potentially cause instability. Therefore, China has technical and political reasons to maintain only 24 ICBMs. He described these incentives and decisions as being part of an asymmetrical stability concept. Ultimately, China will check the United States with respect to missile defense, but it will not go so far as to undermine stability.

One participant familiar with Chinese publications claimed that he had not seen in Chinese publications the same type of debate about stability that is seen in the United States. However, comparable debates do occur. For example, after the U.S. bombing of the Chinese Embassy in Belgrade, debates existed within China over the whether the trend of the time was one that was moving towards peace. Similarly, the issue of whether there is a security dilemma between China and the United States is also being debated by Chinese academics. Ultimately, it appears that there is a growing divergence of U.S. and Chinese views about concepts of deterrence. It was argued that whereas MAD is seen as a point of arrival for the Chinese, MAD is seen as a point of departure for the United States. Furthermore, the Chinese have only recently become comfortable in acknowledging that they have a minimum deterrent and discussing their “credible minimum deterrent.” These contrasts from U.S. approaches to stability and deterrence indicate that the Chinese and U.S. nuclear strategies are likely evolving at different speeds.

What is Required for Deterrence at Low Levels of Nuclear Weapons?

This panel examined the following questions:

- *Do numbers matter?*
- *How can an adversary’s threshold of “unacceptable damage” be determined with a high degree of confidence?*
- *How is deterrence communicated publicly and privately?*
- *What can undermine stability at low levels of nuclear weapons?*

Do numbers matter?

U.S. participants argued that for deterrence and policy decisions, the actual number of nuclear weapons possessed by a country is not highly significant. Furthermore, the relevance of numbers decreases when a country confronts a potentially dangerous situation. The Cold War experience suggests that numbers matter in a relative sense, that is, the “balance” of numbers between countries and each country’s ability to inflict unacceptable damage. For China, the actual number of weapons was less significant than China obtaining a credible retaliatory capability. Alternatively, the Chinese participant argued that at low levels of weapons, a country’s number of nuclear weapons is a critical determinant in deterrence and policy decisions. For example, he claimed nine or ten weapons is more credible than one or two.

Another participant deemed that numbers did matter, but not as much as demonstrating resolve, in that demonstration of resolve provides credibility. It was also suggested that numbers matter to the United States, particularly since numbers serve as a surrogate for survivability.

How can an adversary’s threshold of “unacceptable damage” be determined with a high degree of confidence?

Determining unacceptable damage is difficult, because even if only a small number of targets are hit, diminishing returns set in almost immediately afterwards. Even if a country has a small number of weapons and targets only a few cities, it will still have the effect of leaving decision-makers cautious.

The Chinese participant’s take on this question was that the notion of “unacceptable damage” has a cultural dimension. To his thinking, ten cities is the prevalent Chinese perception of what is “unacceptable” to the United States. However, a growing Chinese assumption is that Washington is unwilling to absorb the loss of even one city. Therefore, Washington would not make a decision to strike China first. He provided another formula for unacceptable damage, claiming that if 10 retaliatory warheads survived, hitting 5% of the population and 10-20% of industry, the resultant damage would suffice as unacceptable. He added that these estimates, however, could be expanded if more resources became available.

How is deterrence communicated publicly and privately?

Fundamentally, deterrence must include physical capability, clear criteria for use of that capability, and the will to use the capability if deterrence fails. Particularly in a relationship where an asymmetrical balance of forces exists, the weak country has to channel clearly – but not necessarily openly - the will to use its capabilities. China has yet to make the conditions clear under which it would be forced to use its nuclear weapons. This may well be because the communication of the threat must leave something to chance.

It is not clear how the Chinese think about nuclear signaling. The issue of signaling is rarely discussed between the United States and China and this lack of dialogue is exacerbated by cultural and language differences. The recent EP-3 incident is evidence of the poor handling of signaling and communication between the two countries. The United States is not tuned to look

for and recognize any such signals that the Chinese may attempt to convey. This may be, in part, because Washington still expects signaling in the modes in which the Soviets conducted signaling, i.e., through movement of forces. Participants concurred that formal channels between Beijing and Washington must be established and tested, so that effective signaling can take place.

Targeting & Communicating Deterrence

It may be useful to think of three levels of policy. The first is declaratory policy, which may or may not be an accurate reflection of national policy. Secondly, there is operational policy or real war plans, which again may or may not be consistent with declaratory policy. Finally, there is practical policy, and this reflects what leaders will actually do in a crisis. In reality, the communication of deterrence may have little to do with what said or what operational plans say. Ultimately, things change when leaders are faced with confronting the reality of carrying out the operational policy or the declaratory policy.

Capabilities were the main dictate in determining targets. If a country has a few weapons, they will aim them at most the most valuable targets they can hold hostage. For China, this means U.S. allies, dependents, and U.S. forces in Asia. This targeting strategy is different from other countries with low-levels of nuclear weapons, namely the UK and France, in that both countries which focused their majority of their deterrent on one adversary.

The folklore of Chinese nuclear targeting posture was brought up during the discussion, with reference to the infamous “Los Angeles for Taipei” comment made to Chas Freeman in the late-1990s. Much debate surrounds the exchange; indeed, some claim that Chas Freeman never took the comment as a direct threat. Regardless of interpretation, the statement highlighted China’s ability to target the continental United States threat. The statement may have been received with hostility in the United States because it reminded U.S. citizens of their vulnerability to a Chinese nuclear attack.

What Could Undermine Stability at Low Levels of Nuclear Weapons?

China’s current ICBMs may be a factor that undermines stability. Some level of Chinese modernization could actually enhance stability, e.g., improvements in Chinese C4ISR or enhanced survivability of Chinese basing modes.

To the Chinese participant’s thinking, a weaker nation adding to its nuclear forces will not undermine stability. Similarly, additions of offensive forces to a stronger states arsenal would not adversely impact stability either. He argued, however, that what does weaken stability is the addition of defenses. One participant asked why the Chinese government has not yet pursued missile defense. In response, the Chinese participant commented that this is due to the fact that China truly believes that the likelihood of nuclear confrontation is low.

Taiwan

A U.S.-China-Taiwan confrontation has a very high likelihood of undermining stability. The Chinese participant commented Beijing is determined to educate its people that even if Taiwan declares independence, it will always remain a part of China. He identified the years 2008 and 2010 as milestones, in that if Taiwan has not declared independence by these dates, then the possibility of a peaceful resolution is much more likely. China is hoping to ride out the next seven to ten years, during which time China will continue to modernize, grow economically and institute domestic institutional change – all factors which will pave the way for peaceful integration of Taiwan into China.

Asymmetry of Stakes and Interests

The discussion of Taiwan brought to light the interesting issue of asymmetric stakes and the role of these stakes in a deterrence relationship. Much room for miscommunication and misperception exists with respect to this issue. For example, in a Taiwan contingency, China may perceive that it has more interests at stake, and therefore ultimately, the balance of resolve will tilt in China's favor. On the other hand, for the United States, any potential involvement of WMD involves other U.S. interests in the calculus of stakes. For both sides, once engaged, interests will tend to escalate in parallel with the conflict. In the end, the potential exists that the Washington may end up tied to its "ultimate concerns," such as its commitment to democracy and the credibility of security commitments (particularly vis-à-vis Japan). As stakes in a conflict increase, so too does the potential that stability will be undermined.

Political Context

It was suggested that deterrence at low levels must occur within the correct political context. In France and the UK's case, both countries formulated their nuclear strategy while under the umbrella of the U.S. nuclear guarantee, and therefore their deterrent was tied into the political relationship. In addition, both countries were located in the midst the U.S.-USSR standoff. The political situation for China is much different, and must be considered when evaluating this country's formulation of deterrence at low levels of nuclear weapons. For China, the leadership anticipates no potential clash other than Taiwan; and ideally, Washington and Beijing can manage this potential for conflict in a political fashion.

Implications for Other Nuclear Powers: Emulation? Innovation? Indifference?

This session considered the applicability of deterrence at low levels of nuclear weapons to the United States and Russia. The session also speculated on potential approaches rogue states and regional powers with a smaller number of nuclear devices may develop to deter or coerce larger nuclear powers.

Rogue States

For rogue states, minimum deterrence appears “good enough,” in that it provides deterrence against neighbors and the United States. For example, North Korea apparently believes that it can coerce the United States with a minimally functional, much less survivable nuclear “force.” The DPRK may also believe that it has the potential for roughly comparable counter-escalation steps. This is due, in part, to its overarching strategy, based on the notion of punishment by many means, e.g., Special Operations. On the other hand, Iraq was never striving for minimum deterrence, but rather has sought a much more substantial nuclear force in being. Iraq’s drive for superiority over its neighbors fueled its ambition to have 40 to 50 weapons; and this constitutes a move beyond “minimum deterrence.” However, for both the DPRK and Iraq, their nuclear posture strives for superiority over local adversaries and some escalation capability versus the United States.

India and Pakistan

For India and Pakistan, the minimum deterrence model seems to fit at first blush. However, upon a closer look, it is uncertain as to whether India and Pakistan really do have minimal deterrence in mind. On the one hand, both countries face pressures to build-up. On the other hand, it seems that both countries may have some problems in trying to use the nuclear shadow for coercion purposes.

Russia

As Russia draws down its number of nuclear weapons, a minimum deterrence model appears unlikely. Instead, Russia will probably increase the number of missions for its nuclear weapons, particularly in order to compensate for conventional weakness and to address stability concerns post-2012 (particularly concerns about U.S. objectives in Joint Vision 2020: “Freedom from attack, freedom to attack”). In addition, Russian expectations and concerns about Chinese conventional superiority, supplemented by Chinese theater nuclear superiority, further detract from the likelihood that Russia will adopt a model resembling minimum deterrence.

The United States

The minimum deterrence model has some interesting implications for the United States and perhaps should be an area of further consideration. Currently, however, minimum deterrence appears to contrast with the recent Nuclear Posture Review. Furthermore, minimum deterrence is not considered by Washington to be a “morally defensible” posture. This assessment is due, in part, to the current U.S. force posture, which stipulates that the United States will maintain the smallest number of nuclear weapons with which can hit the four target categories, while never having to target cities. A minimum deterrence posture implies the reduction of numbers of weapons to a level were a “city-busting” posture would be necessary, and this prospect does not seem palatable for the United States.

In describing the U.S. security environment, it is fairly certain that the United States would be unwilling to accept mutual deterrence relationships with any of the rogue states.

Furthermore, as Washington is faced with a multi-polar environment, perhaps even one with a nuclear-armed al-Qaeda or revolutionary state, concerns about alliances amongst these entities would likely occur. These concerns are evident in current U.S. reluctance to wait on the issue of Iraq.

Where does that leave China?

On a global level, it appears that states are moving away from notions of minimum deterrence; however, these states likely do not desire a return to massive exchanges as a model. If this assertion is true, where does that leave China in terms of its nuclear strategy? For example, if India moves beyond minimum deterrence, Russia remakes its posture into one with a more robust theater emphasis, the United States opts for superiority of offense while dealing with multiple threats at same time, and rogue states seek more than minimal deterrence, China's nuclear posture will likely not remain static. In response to these developments, China will likely accelerate a move away from minimalism, but it will probably avoid building up its forces to parity with the United States.

China's nuclear posture has several requirements. To begin, it must be multi-tiered in order to face local and long-range problems. Next, China must be able to absorb first a first strike and then retaliate, through the defense. In addition, it must be retain the ability to reply one more time in order to keep America from coming back with a devastating response. That is, China must be able to retaliate not once but twice. Absent from China's posture, in contrast to the current U.S. position, is an emphasis on nuclear weapons for defeat and war termination.

A Chinese Perspective

The Chinese participant shared his views on the applicability of the Chinese model for other countries. He seemed to think that Russia would sustain its large number of nuclear weapons for as long as it can afford, if the Russian economy improves. If the economy does not improve, Russia will likely draw down further its forces.

The United States should have the least need for nuclear weapons. Washington has three potential enemies: China, Russia, and other rogues. If Washington is successful in forging a partnership with Russia, then 2,200 warheads are excessive. This number, combined with the U.S. reserve stockpile, is an un-proportional response to the threats faced by the United States.

Moreover, if China does not improve drastically the number of its nuclear weapons but rather only modernizes for quality, and the U.S.-Russian relationship continues to warm, then both Moscow and Washington have no excuse for maintaining the current level of nuclear weapons without reductions. Also, a U.S. decision to maintain a large number of weapons for global dominance purposes would ultimately be harmful to the United States.

The Chinese participant argued that the United States and Russia would not adopt a posture of "nuclear lowism." He discussed the U.S. pledge to move towards lower number of nuclear weapons upon China joining multilateral disarmament. However, China will not join multilateral disarmament until Washington has abandoned its responsive force. This situation is

unlikely, particularly because of U.S. discomfort with the conditions of lowism. “Lowism” would exist when the number of Chinese, French, and British nuclear weapons, as a combined total, equal the number of U.S. weapons. Ultimately, he recommended P-5 multilateral talks in order to formulate some possible frameworks for these reductions.

India and Pakistan

The Chinese participant argued that India is a concern in Chinese strategic planning. However, in essence, India’s nuclear weapons are designed to be a “status check” against Pakistan. For Pakistan, Indian nuclear testing compelled Pakistan to admit it had nuclear weapons. Pakistan’s first choice would have been a nuclear assurance from China. When China did not provide this guarantee to Islamabad, Pakistan tested its devices in 1998.

In terms of minimal levels of nuclear weapons and stability, he argued that India should refrain from developing more weapons. An acceptable level of development would be nowhere beyond 100 weapons, in order to ensure stability. India should admit inferiority, as China does with respect to the United States, thus providing China an incentive to not respond to any Indian buildup and thereby further increase stability in the region. Similarly, given that Pakistani buildup is conditioned on the Indian decision, a low level of nuclear weapons is a preferable posture for India.

Israel

The Chinese participant expressed his belief that Israel has around 100 weapons. Two problems exist with this posture. First, many view Israeli nuclear weapons as evidence of the United States’ double standard regarding which countries should be permitted to possess nuclear weapons. Secondly, 100 nuclear weapons are not a proportional posture when compared with the rest of the Middle East, and therefore the number of Israeli nuclear weapons goes beyond regional sufficiency.

North Korea

The Chinese participant deemed that North Korea’s “illegal” nuclear program as harmful to both U.S. and Chinese interests. Furthermore, he believed the North Korea program to be destabilizing the region as a whole, while simultaneously posing political problems for China. It is in China’s interest that the Korean peninsula remains non-nuclear. Although Chinese and U.S. interests overlap on this issue, the two countries are taking very different approaches. Despite North Korea’s violation of arms control agreements, the U.S. response, including placing the DPRK on the U.S. targeting list, is counterproductive. North Korea needs a better security environment in order for the situation to improve. Currently, North Korea is using ambiguity to strengthen its security.

In order to ameliorate the situation, North Korea should not be allowed to attain a nuclear deterrent. However, the United States must open discussions with North Korea and perhaps provide a mutual non-aggression commitment. Within this context, North Korea may then invite inspections, freeze its program, and possibly re-adhere to the NPT.

Another participant noted that China has the most leverage in the North Korea situation; China had the ability to cut off aid in terms of food and other resources. The participant suggested that China would not threaten to use this leverage out of concern about an influx of North Korean refugees.

The Chinese participant responded that the China-North Korea relationship is multi-dimensional. The Chinese believe that North Korea has a security utility in that it distances China from United States, which is good in the context of Taiwan. If the Chinese were to cut aid, several possibilities could ensue. First, North Korea may cooperate but hostile relations with China would occur over the long term. Or, North Korea could collapse with troublesome implications for military adventurism and for China. China would prefer to have an alternative to both of those outcomes, and for that matter, would prefer to hold onto its leverage while other alternatives exist. China will use its leverage only after North Korea has been given the assurance necessary to accept inspections.

Reconciling Views

An American participant commented that the numbers in the American nuclear posture are driven by Russia and China. In 2012, however, it is likely that these numbers will drop precipitously. Uncertainty, especially about the transition in Russia, is a critical factor determining the U.S. nuclear force posture. If bi-lateral relations continue to warm, then Washington might be prepared to undertake major reductions. However, if the Russian transition goes poorly, the United States will deem that it needs to retain more nuclear weapons.

Transition is occurring in China, as well. Washington remains unclear as to whether China, as it becomes the second political-economic power, will seek to become the second nuclear power as well, replacing Russia. The United States would likely retain a large enough arsenal so that China is never tempted to compete in an arms race. By 2012, however, missile defense may have persuaded China to develop more nuclear weapons.

Another participant noted that there are definite gaps in stability visions and possible levels of nuclear postures between the United States and China. Diverging views on the use and salience of nuclear weapons and of readiness and targeting could potentially cause misunderstanding, misperception, and miscommunication. This necessitates strategic dialogue so that the two countries refrain from talking past each other and lessens the risk of surprise.

In terms of numbers, the Chinese participant claimed that China still views U.S. force posture as excessive, particularly given that China is seeking to integrate into the world system and does not see itself as a threat. However, certain domestic events might have fostered the perception that China is not as peaceful as it perceives itself. In terms of the strategic environment in which the United States will be operating, he predicted that in looking out 10 to 20 years, there would likely be economic pressures on Russia to cut its arsenal, particularly if the economy does not improve. Mainland China and Taiwan will exist with peaceful links, thus relieving the burden on the United States. If this strategic context comes to pass, then the excessiveness of the U.S. nuclear weapons posture would, in his view, be proven.

Another American participant elaborated on the major constraints that the United States faces with respect to adopting minimal deterrence strategy. He listed the constraints as bureaucratic (changes in the Triad posture), psychological (uncertainty about the future), and finally a reluctance to target cities.

A participant then questioned that while a long-term strategic vision is helpful, it is also important to evaluate what kind of things the Chinese look for on a continuous basis in terms of behavior of other states; and in that respect, what behaviors the United States should be looking for? These continual indicators may determine where the strategic vision will ultimately end.

The Chinese participant's response was that currently, a key indicator of strategic trends for China is Taiwan. If Taiwan does not declare independence by 2010, it will likely never do so. China will continue to press Taiwan to be peaceful with the mainland, and in that respect, China will expand two-way investment and trade. Some other critical indicators in the interim would include the opening of official links between the two countries over the next one to two years. Furthermore, the victor of the Taiwanese 2004 presidential race will be an indication of the future strategic picture. If these early indicators go smoothly and Taiwan does not risk independence in the next ten years, then a gradual, peaceful, mutual accommodation over the next 50 years can be expected.